Alfred P. Sloan Foundation

2015 Annual Report

Contents

Cover: Italian volcano, Mt. Etna, erupts. Characterizing the role volcanos play in the global carbon cycle is one of the primary research objectives of the Deep Carbon Observatory.
(PHOTO COURTESY OF ALESSANDRO AUIPPA)

Preface

The **ALFRED P. SLOAN FOUNDATION** administers a private fund for the benefit of the public. It accordingly recognizes the responsibility of making periodic reports to the public on the management of this fund. The Foundation therefore submits this public report for the year 2015.

Mission Statement

The **ALFRED P. SLOAN FOUNDATION** makes grants primarily to support original research and education related to science, technology, engineering, mathematics, and economics. The Foundation believes that these fields—and the scholars and practitioners who work in them—are chief drivers of the nation's health and prosperity and that a reasoned, systematic understanding of the forces of nature and society, when applied inventively and wisely, can lead to a better world for all.

2015 Year in Review

Dr. Paul L. Joskow

The Alfred P. Sloan Foundation administers a private fund for the benefit of the public. It accordingly recognizes the responsibility of making periodic reports to the public on the management of this fund.

So began the preface of the first ever annual report of the Alfred P. Sloan Foundation, published in 1939. It's a bit musty as openings go—I admit—but it also has its virtues. It's clear. It's to the point. And it reminds us of something important: that what the Sloan Foundation does each year it does for the public, and we have a corresponding duty to keep the public informed about what it is we do on their behalf. So we've kept those opening sentences around, mustiness and all. More than seventy five years later, they remain the first sentences of our annual report.

The 2015 Annual Report of the Alfred P. Sloan Foundation contains an accounting of the grantmaking activities of the Foundation for the calendar year ended December 31, 2015. The report contains descriptions of our grantmaking programs and a comprehensive account of grants made, to whom we made them, and what each aims to accomplish. The report also contains a financial review, the Foundation's independently audited financial statements, and a list of all Trustees and staff.

In this review, I will summarize the Foundation's grantmaking in 2015 as well as briefly (and incompletely) highlight some of the accomplishments and findings of our grantees.

STEM research

Sloan Research Fellowships

The Foundation's signature program, the Sloan Research Fellowships seek to stimulate fundamental research by providing $50,000 in research support to outstanding early-career researchers in the United States and Canada. The fellowships were launched in 1955 by Alfred P. Sloan himself and were initially awarded to young physicists, chemists, and mathematicians. Since that time, they have expanded to include researchers in eight fields, including neuroscience, economics, ocean sciences, computational and evolutionary molecular biology, and computer science. In 2015, Sloan Research Fellowships were awarded to 126 extraordinary researchers who, despite their young age, are already doing exciting, pioneering work. Among the 2015 cohort of Sloan Research Fellows is a computer scientist who designs software to inhibit state-level censorship of the internet; a chemist who has devised a way to deliver macromolecules directly to the interior of mammalian cells, and an economist who studies the factors that drive innovation in health care.

Sloan Research Fellows often go on to become some of the most influential and celebrated scholars in their fields. In 2015, President Barack Obama announced the 12 recipients of the National Medal of Science, the highest honor the U.S. government awards to scientific researchers. Among the recipients were three former Sloan Research Fellows: mathematician Michael Artin and chemists Geraldine Richmond and Paul Alivisatos. The three join 65 other Sloan Research Fellows who have also won the award. Also in 2015, the American Economic Association announced that the John Bates Clark Medal, which honors extraordinary achievement by a U.S. economist under the age of 40, was to be awarded to Harvard economist Roland Fryer. Fryer received a Sloan Research Fellowship in 2007. The announcement marks a particularly impressive stretch for the Sloan Research Fellowships in economics. Though only eight Sloan Research Fellowships are awarded in economics each year, 15 fellows have won the Clark medal since 1987, including every medal winner since 2009.

Deep Carbon Observatory

The Deep Carbon Observatory (DCO) is a multinational, multidisciplinary collaboration of more than 1,000 scientists across 40 countries that are working together to revolutionize our understanding of the abundance, distribution, movement, and unique properties of Earth's subsurface carbon and the role that carbon plays in the origin and limits of life, the creation of hydrocarbons, and the global carbon cycle. The DCO is divided into four scientific communities, each tasked with investigation of a different area of deep carbon research. One investigates the unique physical and chemical properties of carbon under the extreme temperatures and pressures of Earth's mantle; another focuses on the location and size of deep carbon reservoirs and how carbon moves between the mantle and surface; a third community examines deep energy, the formation and abundance of abiotic hydrocarbons, and how chemical reactions between subsurface minerals and water generate energy; and a fourth characterizes microbial life in the deep biosphere and how it relates to life on the surface. In 2015, the Foundation made $1.25 million grants to each of these four communities to allow them to continue their scientific work in the run-up to the contemplated completion of the DCO in 2019. Another major grant supported a multidisciplinary project to create a series of linked models that synthesize current findings, expose gaps in our knowledge, and explore the dynamics of the deep carbon system as a whole.

Findings by Deep Carbon Observatory researchers continue to make news both inside the research community and with the public. Scholars working in the DCO's Deep Life community are discovering an increasingly diverse panoply of microorganisms who make their home miles beneath the surface, challenging the once widely held view that the searing hot, high pressure environment deep in the Earth is too hostile to support life. In 2015, one DCO team discovered a species of deep Earth microbe that has not evolved in nearly 2 *billion* years. Other research suggests that diamond may be formed from ancient seawater that has become trapped underground. And geologist Robert Hazen, who directs the DCO from the Carnegie Institution of Washington, has made significant strides in articulating the ways in which the biological and mineral diversity of the planet have co-evolved over the millennia, with changes in biological systems driving changes in Earth's mineral composition, which in turn creates new environmental niches for the biosphere to exploit.

Microbiology of the Built Environment

The Foundation's Microbiology of the Built Environment (MoBE) program aims to build a new field of scientific inquiry focused on understanding the microbial ecology of the indoor environments in which we work and play. MoBE researchers are continuing to make significant discoveries about indoor microbial populations. In 2015, researchers discovered that humans are unique contributors to the microbiome of spaces they occupy and that human occupancy can significantly alter the microbial composition of a room in mere hours. What's more, the microbial cloud surrounding a person appears to be relatively unique, which means that as we move from room to room or space to space, we leave an identifiable microbial "fingerprint" behind us. Research on the microbial populations of hospitals demonstrated that "sterile" hospital environments are anything but and suggested that by changing occupant activity and building design, hospitals can shape the microbial composition of hospital rooms in ways that make them more or less hostile to pathogens.

Major grants in 2015 went to support the University of Oregon's Biology and the Built Environment Center, which serves as a crucial research and training hub for the study of indoor ecology; to support the continued operation of microBE.net, an online network that provides resources to the diverse, multidisciplinary MoBE community; to expand a major fungal database to include built environment fungi; to fund a study of how air conditioning systems affect microbial communities in commercial spaces; and to support the development of new software that will integrate genetic data on indoor microbes with information on the environmental and compositional attributes of the buildings in which they live.

As MoBE research has matured, it has shown indoor environments to be the home of complex biological ecosystems. But almost nothing is known about the basic chemistry of such ecosystems: what chemicals predominate indoors, how those chemicals interact, and what byproducts those interactions produce. The particular findings of MoBE researchers have led to the larger discovery that indoor spaces are complex physio-chemical environments that have been virtually unexplored by modern science. As such, in late 2015 the Trustees of the Sloan Foundation approved the creation of a new scientific grantmaking program to investigate the basic chemistry of indoor spaces. The new program, called the Chemistry of Indoor Environments program, will begin major grantmaking in 2016.

Sloan Digital Sky Survey

Using a 2.5-meter optical telescope at Apache Point Observatory in New Mexico, the Sloan Digital Sky Survey has, for nearly two decades, been one of the most important and influential astronomical surveys ever conducted. A pioneering experiment in open science, the SDSS was among the first major telescopic surveys to release all its data to the public under open access principles. The results have been impressive. SDSS data has been used in nearly 6,000 peer-reviewed articles since the project achieved first light in 1998 and those papers have in, turn, been cited nearly a quarter of a million times.[1] Many SDSS-driven discoveries made headlines in 2015, including the discovery of a massive black hole 12 *billion* times larger than the sun; the discovery of a super-dense galaxy that is 200 times smaller than the Milky Way, but 10,000 times as dense; the finding that 30 percent of stars in our home galaxy of the Milky Way have significantly change their orbits; and the uncovering of new evidence about how and why galaxies die. A budding collaboration with the 2.5-meter du Pont Telescope located in Las Campanas, Chile will open new avenues for research studying the history and formation of the Milky Way from the southern hemisphere.

Though the Sloan Foundation has a separate grantmaking program devoted to improving the recruitment, retention, and advancement of underrepresented minorities in science and engineering, all of our grantmaking programs strive to promote diversity and inclusiveness in the scientific enterprise. In 2015, the Foundation made a $700,000 grant to the Astrophysical Research Consortium to fund the development and implementation of two training programs within the SDSS collaborative. One pairs talented underrepresented minority graduate students with established senior mentors in the SDSS collaboration. The second program provides summer research experience related to SDSS for interested undergraduates from underrepresented groups. The grant illustrates the priority we place Foundation-wide on ensuring scientific education and careers are open and accessible to all.

1 See www.sdss.org/science

STEM Higher Education

Education and Advancement for Underrepresented Groups

The Foundation's program for the Education and Advancement for Underrepresented Groups seeks to diversify higher education in STEM fields through college and university initiatives. The program operates primarily through the development and support of University Centers of Exemplary Mentoring (UCEMs). UCEMs are campus-based initiatives that provide fellowship support to underrepresented minority graduate students in STEM fields. The UCEMs also host an array of activities designed to promote student success, including faculty and peer mentoring, seminars on effectively managing the challenges of graduate life, and networking and professional development opportunities. In 2015, a $2 million dollar grant from the Foundation to the National Action Council for Minorities in Engineering (NACME) supported the creation of three UCEMs, one at the Massachusetts Institute of Technology, one at the University of California, San Diego, and one at the University of Illinois, Urbana-Champaign. The grant brings the total number of supported UCEMs to eight.

Other grantmaking in 2015 provided ongoing support to the Institute for Teaching and Mentoring, an annual multi-day professional development conference that is the largest assembly of minority doctoral students in the country, and funds to support an innovative new training program at Harvard University, the Research Scholar Initiative, that prepares talented minority post-baccalaureate students for the rigors of graduate study in economics.

In 2013, the Foundation made a series of six small grants to a diverse array of scholars in computer science and the social sciences to examine critically the evolving role of women in computing and information technology (IT). A cursory look at enrollment, graduation, and career data suggested that the broad field of computing is becoming, perhaps alone among the sciences, less friendly to women than it was several decades ago. Given the obvious importance of computing to the 21st century economy, the Foundation thought it important to look more closely at the issue. In 2015, these grantees came together to report their findings, discussing such issues as the various definitions of computing and IT, what extant datasets can and cannot show, how increased numbers of international students in graduate programs affect enrollment and graduation rates, contrasts and similarities between the computing workforces in the academic and private sectors, and how cultural and educational factors unique to computing may be turning off women from pursuing majors, advanced degrees, and careers in the field. Several articles have been published already, for example in high-impact journals in computer science and psychology; more are in development.

Public Understanding of Science, Technology & Economics

The Foundation's multi-media program bridging the gap between the "two cultures" of science and the humanities continued to commission, develop, and produce a slate of popular, critically acclaimed works in 2015.

Ten Sloan-supported books were published through the Foundation's book program in 2015: *Hell and Good Company* by Richard Rhodes, which examines developments in medical and military technologies ushered in by the Spanish Civil War; *Rust* by Jonathan Waldman, which explains the engineering challenges in combating rust and corrosion; *Vitamania* by Catherine Price, which explores the history and technology of the development of the vitamin industry; *Finding Zero* by Amir Aczel, a walk through the history of number theory; *Infested* by Brooke Borel, about bed bugs and the surprising ways they have driven our culture; *From Darkroom to Daylight* by Harvey Wang, about how the advent of digital technology has transformed photography; *My Fair Ladies* by Julie Wosk about the intersection of technology and changing conceptions of femininity; *Resurrection Science* by M.R. O'Connor, about the ethics of cloning long-extinct species; *Our Robots, Ourselves* by David Mindel, about robotics and the rapidly evolving relationship between humans and machines; and *Failure* by Stuart Firestein, about the crucially important role setbacks and missteps play in the process of scientific inquiry.

In film, *The Imitation Game*, about the life of cryptographer Alan Turing, was nominated for eight Oscars including Best Picture and won the 2015 Oscar for Best Adapted Screenplay, becoming the first Sloan-supported film to receive an Academy

Award. *The Imitation Game* won the Sloan Feature Film prize at the 2014 Hamptons Film Festival and received a Sloan post-production grant from the Tribeca Film Institute. Two other Sloan supported films, *The Stanford Prison Experiment* and *Experimenter* were released in theaters in 2015 to positive reviews. *The Man Who Knew Infinity*, based on the Sloan-supported biography of Indian mathematician Srinivasa Ramunajan and supported by two Sloan film grants, premiered at the Toronto International Film Festival, becoming the 15th completed feature film developed through the Sloan pipeline.

In television, the 2015 season of the PBS documentary series *American Experience* showcased three episodes on scientific and technical themes: *Edison*, about the famed inventor; *The Big Burn*, about a massive forest fire in 1910 that changed the course of American forestry; and *The Forgotten Plague*, about the history of tuberculosis. Also in 2015, PBS's NOVA aired a Sloan-supported three-part documentary, "Making North America," about the geological history and evolution of the North American continent. *Science Goes to the Movies*, a new review show created by Sloan that looks at the scientific content and themes of popular films and television aired on CUNY TV. Enthusiastically embraced, the show is slated for national distribution through PBS in 2016, only the second series from CUNY-TV to ever gain a nationwide audience. The third season of Charlie Rose's *Brain Series: Brain Science and Society* also aired on PBS stations. Co-hosted by Rose and Nobelist Eric Kandel, the series brings together experts to discuss how recent developments in neuroscience affect our understanding of pressing social issues like gender identity, the roots of aggression, and the effects of concussions and sports injuries on the adolescent brain. Finally, PBS aired *Ken Burns Presents Cancer: The Emperor of All Maladies* in 2015. Based on the Pulitzer Prize-winning book by Siddhartha Mukerjee, the award-winning, three-part documentary series explores the history of attempts to cure cancer and both the promise and limits of our current understanding of the disease.

In the Foundation's Theater program, the Manhattan Theatre Club staged a critically acclaimed Broadway production of *Constellations*, a new play by playwright Nick Payne that uses quantum physics as the backdrop for exploring all the seemingly minor choices that affect a budding romance. Starring Jake Gyllenhaal and Ruth Wilson, the Tony-nominated show played an extended run to sold out audiences. The Ensemble Studio Theatre partnered with Primary Stages to produce the world premiere of Deborah Zoe Laufner's *Informed Consent*, about a conflict between researchers at the University of Arizona and the Havasupi Indian tribe they were studying. In addition, *Photograph 51*, Anna Ziegler's Sloan-supported play about Rosalind Franklin's underappreciated contributions to the discovery of the structure of DNA, was remounted on London's prestigious West End. The production featured Nicole Kidman in an award-winning turn in the leading role.

Several new initiatives began in the Foundation's Radio program in 2015. Sloan grantees Radiolab and Studio 360 continued to produce high quality science-themed podcasts. A grant to WNYC resulted in the launch of *Only Human*, a podcast on new advances in medical science, healthy living, and the economics of health care in the aftermath of the passage of the Affordable Care Act. PRX, the Sloan-supported grassroots marketplace that connects independent radio producers with distributers across the country, launched a new all-female podcast, *Transistor*, where astrophysicicst Michelle Thaller, neuroscientist Wendy Suzuki, and biologist Christina Agapakis explore the latest scientific developments and stories in the science news.

Economics

Economic Institutions, Behavior, and Performance

The Sloan Foundation was founded in 1934 as an organization devoted to promoting economic education and high-quality research. This goal still lies very much at the heart of what the Foundation does. In 2015 the Foundation continued its support of economics, focusing on several interrelated themes, including the creation of more sophisticated macrofinancial models; using behavioral economics to study household consumer behavior; and uncovering the methods, motivations, and mechanisms that drive scientific and economic progress.

In 2015, major support included funds for the University of Chicago's Macrofinancial Modeling Group, a collection of macroeconomists, econometricians, and finance experts who are working to create predictive models of the macroeconomy that incorporate financial intermediaries like banks; a grant to support the development of sophisticated

algorithms capable of querying and analyzing personal or sensitive data while protecting privacy; a grant to support an investigation of whether and under what conditions you can increase welfare by using behavioral economics and choice architecture to "nudge" individuals toward certain outcomes; a Carnegie Mellon University study of whether consumers use the web differently when their actions are shielded from scrutiny by privacy-enhancing software; a project to run a prediction market about the replication of important results in economics; an experimental study of behavioral factors that affect the uptake of benefits in the SNAP food stamp program; and a study of the relationship between research investment, scientific breakthroughs, and economic growth.

Grantees in our economics program were productive in 2015. A Sloan-supported fellowship at the AAAS allowed Dr. Maya Shankar to set up a Social and Behavioral Sciences Research Team based at the White House Office of Science and Technology Policy. The team runs randomized controlled experiments that test behavioral nudges designed to make existing government policies and practices work better. A report issued by the team in 2015 drew on dozens of experiments that showed how small changes in choice architecture could help veterans sign up for benefits, farmers obtain loans, and vendors pay their taxes. Also in 2015, a study led by Richard Morgenstern looked at how pre-regulatory estimates used to justify 22 different government programs compared to their post-regulatory effects. Morgenstern found that in many programs, real world impacts fell short of the estimates, including in the Acid Rain program, the FDA's egg testing rule, and regulations governing air toxicity and paper production.

Working Longer

The Foundation's Working Longer program supports scholarly research on the labor market behavior of older Americans and the institutional, social, economic, and regulatory barriers that inhibit working past conventional retirement age. In 2015, the Foundation provided major research support for a study by Larry Kotlikoff of work disincentives created by federal regulations; for a study of how willing physicians are to take on new Medicare patients and how this willingness affects older Americans; for research looking at whether and to what degree different sorts of activities can speed or slow cognitive decline in aging populations; and a study on the factors that affect the interrelated retirement decisions of households where both partners work. Other major grants supported two fellowship programs for young scholars working on issues related to aging and work: a dissertation-support program at NBER and a postdoctoral fellowship program at Harvard. Also supported in 2015 was a Columbia University training program that brings journalists covering the older worker beat together with top aging researchers to educate them on the latest scholarship.

Several grants made in prior years in the Working Longer program came to fruition in 2015. An audit study conducted by researchers at Arizona State University produced interesting results. Submitting a series of fictive resumes to real job openings, the team found that resumes of older workers received significantly fewer callbacks than similar resumes submitted by younger applicants; that, for unemployed job applicants, the duration of unemployment made little to no difference in callback rates; and that applicants who had taken a temporary "bridge job" while looking for longer term employment fared significantly worse on the job market than those who did not. In other work, a Sloan-funded team at UCLA looked at how intergenerational transfers within families affect labor supply. The team found that the incidence of late middle age families supporting both parents and children is increasing, that intergenerational giving does not vary significantly by gender, and that the form intergenerational transfers take, whether time or money, is significantly correlated with a caregiver's labor force attachment.

Digital Information Technology

Data & Computational Research

Grants in our Data & Computational Research program aim to accelerate scientific discovery by helping researchers fully exploit the opportunities created by recent advances in digital information technology. Grants cover a wide range of activities, including software development, promoting the targeted adoption of effective tools and practices by scientists, research on the data-related needs and practices of scientists, and efforts to build a thriving data-science community that can serve the scientific enterprise as a whole.

Major software grants in 2015 went to support the continued development of the Jupyter scientific computing platform; for the expansion of Harvard's Dataverse data management platform to allow it to better handle large datasets; to expand the Dat peer-to-peer data sharing platform in ways that increase its usefulness in the social and natural sciences; and for the continued development and dissemination of Stan, a programming language that simplifies Bayesian probability models and analysis. Additional new grants support a Carnegie Mellon team studying hackathons and other "community code engagements" in order to develop best practices for organizing such engagements effectively, and continued support for data and software curation fellows to be embedded at major university research libraries by the Council on Library and Information Resources.

Several key initiatives undertaken in prior years began to show results in 2015. With Sloan-funding, the rOpenSci community developed and released several packages for the R programming language that deal with data publication, integration, and reproducibility. The packages are in heavy use and the rOpenSci community has now secured significant funding from the Helmsley Trust. Sloan grants also allowed Globus, a project of the University of Chicago's Computation Institute that provides data transport services for large datasets, to develop an effective business plan, acquire clients, and move toward independent sustainability. Sloan-funded research found that mentoring clinics aimed at teaching researchers about data analysis were a particularly effective opportunity to get researchers thinking about privacy and other ethical issues surrounding data use and management. Finally, the Sloan-funded Mozilla Science Lab was able to successfully spin off Software Carpentry, an initiative which runs workshops that teach software engineering skills to university researchers, into its own sustainable and independent organization.

Scholarly Communication

The Foundation's program in Scholarly Communication funds efforts to help scientists better communicate with one another and better manage the increasingly diverse array of communications channels that has become a hallmark of the digital era.

In 2015, significant Foundation support went to a project to develop better tools for algorithmically searching the academic literature in mathematics; to promote the effective use of community engagement managers in scientific professional societies; to support outreach and adoption of the PressForward editorial curation platform; to expand the SHARE research tracking platform; and to support the development of a flexible paywall software for scientific data repositories.

Projects completed in this program in 2015 included the creation of an online database of over one million college course syllabi, the integration of ORCID researcher identifiers into 13 different university systems, and the successful development and deployment of an open source program for managing the production of scholarly book reviews.

Universal Access to Knowledge

This program, with its ongoing support of Wikipedia, seeks to use the latest advances in digital information technology to democratize knowledge. Grants in 2015 continued support for the Sloan-initiated Digital Public Library of America (DPLA), a collaboration of over 1900 libraries, museums, and other cultural institutions devoted to opening the nation's literary and cultural heritage to all. A major 2015 grant to the DPLA funds the expansion of its service hub network. Service hubs serve as on-ramps for new digitized content from every state, helping regional and local institutions deploy their own DPLA installations and acting as local DPLA help desks. Sloan funds also supported a joint initiative by the DPLA, the White House, and commercial publishers that provides free eBooks to underprivileged K-12 students. Kicked off by President Obama in April 2015, the Open eBooks initiative launched in February 2016 and has provided free books to more than two million students in need at 60,000 schools nationwide.

Energy & Environment

The Foundation's Energy & Environment program aims to advance our understanding of the economic, environmental, security, and policy tradeoffs associated with the deployment of low- and no-carbon resources and technologies across the energy system. In 2015, major grant support went to the University of California, Berkeley to expand its E2e research collaboration, a nationwide network with hubs at Berkeley, MIT, and the University of Chicago, that facilitates and coordinates high quality scholarship on the economics of energy efficiency. Grantmaking related to shale oil and gas

included support to the Environmental Defense Fund to organize a series of projects to better quantify methane leakage from methane gas end-users; to Duke University to analyze the fiscal impacts of shale and gas development on local communities; and to the University of Texas, Austin to study the characteristics of wastewater from fracking. The program's educational component was strengthened by initiating two fellowship programs, one to the National Bureau of Economic Research to support predoctoral students and one to Resources for the Future to support postdoctoral researchers.

Sloan-supported work related to energy and the environment made major news in 2015. A research team consisting of Meredith Fowlie and Catherine Wolfram at the University of California, Berkeley, and Michael Greenstone from the University of Chicago, released the results of a major study focusing on the implementation of the Weatherization Assistance Program in Michigan. The team collected data from more than 30,000 homes, analyzing how government-subsidized weatherization impacted energy savings. They found, contrary to projections, that the upfront costs of the project are nearly twice the actually accrued energy savings. In addition, the Foundation-funded "Future of Solar" study was released by MIT in May 2015. The multidisciplinary report, which drew on expertise from economists, engineers, technologists, and policy experts, contains several provocative recommendations, including a call for rethinking subsidies provided for household-level, as opposed to grid-scale, solar installation; uniform regulatory standards in solar panel permitting and inspection; and increased research into thin-film photovoltaic cells made from Earth-abundant materials.

INITIATIVES

New York City Intiatives

The Foundation has been headquartered in New York City since its founding in 1934 and has long recognized an obligation to give back to the city we call home. Our New York City Initiatives program aims to benefit the City and its residents in ways connected to the Foundation's mission. The Foundation funded several important initiatives in 2015, including funding for an experimental study of whether Twitter could be used to reliably detect foodborne illness outbreaks; renewed support to the New York Genome Center, which provides gene sequencing and bioinformatics services to a coalition of more than a dozen New York scientific and medical institutions; and major support for expansion of the BioBus, an experiment in education that has retrofitted a city bus into a mobile biology lab, bringing exciting biology experiments to underserved students across the five boroughs. The Foundation also continued its support for several longstanding initiatives that benefit city residents, including the Sloan Public Service Awards, which honor excellence in municipal public service; the Sloan Awards for Excellence in Teaching Science and Mathematics, which honor extraordinary science and math instruction in the city's public high schools; and InsideSchools.org, a website that provides comprehensive data to parents about the quality and course offerings of the city's public schools.

Internal Matters

I am pleased to announce that on January 1st, 2015, Dr. Francine Berman joined the Alfred P. Sloan Foundation Board of Trustees. Dr. Berman is a distinguished computer and data scientist—she is the Edward P. Hamilton Distinguished Professor in Computer Science at Rensselaer Polytechnic Institute—and has been widely recognized for her visionary leadership in fostering the innovative uses of technology to advance scientific research. I know I join the rest of the Trustees in welcoming Dr. Berman to the Sloan family and I look forward to working with her in the years ahead in furtherance of the Foundation's mission.

Also in 2015, the Foundation was saddened to announce the retirement of William B. Petersen, the Foundation's longtime Senior Vice President and Chief Investment Officer. Bill created the Chief Investment Officer position at Sloan and for 16 years he ably oversaw the endowment left to us by our Founder. I extend to him the grateful thanks of the institution he served so well for so long. Bill will be replaced as Chief Investment Officer by Elizabeth M. Hewitt. Named after an exhaustive search, Hewitt is the former Managing Director of Public Investments for the Robert Wood Johnson Foundation and brings to the CIO position a wealth of experience managing diversified asset portfolios and a proven track record of effective manager selection and oversight. I welcome Elizabeth to the Sloan team and look forward to collaborating with

both her and the Foundation's Investment Advisory Committee in building a strong, diversified endowment portfolio that will meet the Foundation's needs in the years to come.

Conclusion

In 2015, the Foundation approved 313 grant totaling nearly $80 million in support of research and education in science, technology, engineering, mathematics, and economics. Eighty-one years after its creation in 1934, the Alfred P. Sloan Foundation continues to faithfully execute the vision of its founder, helping scientific pioneers press the boundaries of what is known and aiding them in the careful, methodical, incremental advance of our mastery of the laws of nature and society. *Onward.*

President's Letter

Diversity & Inclusion Initiatives at the Alfred P. Sloan Foundation (1950–2016)

Dr. Paul L. Joskow, President

Introduction[1]

The Alfred P. Sloan Foundation is most widely known for its support of basic research in the natural and social sciences; for its sponsorship of several high profile, high quality media programs like *Radiolab*, *NOVA*, and *American Experience* that educate the public about science, technology and economics; and for its role in founding several marquee scientific and educational institutions that bear its name, including the Memorial Sloan Kettering Cancer Center in New York City, the MIT Sloan School of Management, and the Sloan Digital Sky Survey. My previous annual letters have focused on these core activities. Less well known—I think unjustly—is the Foundation's six-decade history of support for increasing educational opportunity, diversity, and inclusion for members of underrepresented minorities and women in a variety of scientific and technical fields. Pursuit of these goals has been every bit as central to the Foundation and its mission over its history as has support for research and public education about science, technology, and economics. Of course the theories of change and the goals that guided the Foundation's initiatives in these areas have evolved over time. This evolution is both interesting and follows closely the historical developments associated with the Civil Rights movement, school integration, and federal support for minorities seeking baccalaureate, professional, and graduate degrees. The history also reflects lessons the Foundation learned from experience; changes in its thinking; and attempts to identify gaps in the design or implementation of educational initiatives launched by colleges and universities, the government, and private philanthropy. I think the evolution of the Foundation's diversity and inclusion programs is a story worth telling.

1 I am grateful to Nate Williams, Liz Boylan, and Marta Tienda for their invaluable assistance in preparing this letter.

The Foundation's recent diversity-focused efforts fall into four broad categories:

1. The **Education and Advancement for Underrepresented Groups**[2] program makes grants specifically aimed to increase the diversity of higher education and the scientific and research workforce in STEM fields.

2. Our **Public Understanding of Science, Technology and Economics** program, while not explicitly minority-focused, devotes much of its grantmaking towards supporting projects that highlight the often underappreciated contributions of women and minority scholars and promoting the work of women and minority authors, directors, screenwriters, and playwrights.

3. **All Sloan's grant programs** make grants within their own fields of interest that support the diversity of the scientific and research workforce.

4. **Sloan's grantmaking process** has been enhanced to ensure that grantees, whatever the nature of their particular project, are mindful of diversity and structure their grant-funded work in ways that promote the inclusion of women and underrepresented minorities.

In what follows, I will begin with a brief discussion of what I mean by the terms "diversity" and "inclusion." I will then discuss the Foundation's rationale for continuing to invest substantial funds to promote diversity and inclusion of underrepresented minorities and women and why our support takes the form that it does. I will then give a brief history of the Foundation's diversity-related grantmaking and then conclude with some reflections on that history.

What is Diversity and Inclusion?

The U.S. has a very heterogeneous population along racial, gender, ethnic, economic, family origin, and other dimensions, one that has and will continue to become more heterogeneous over time. Efforts to increase "diversity," as I shall use that term, refer to efforts to see that heterogeneity reflected in our society. Diversity is typically measured by counting, in our case, counting the relative number of women and minorities among the nation's science, engineering, and economics graduate students, faculty, and researchers. But diversity must be more than a numbers counting game. Equally important is ensuring that women and minorities are full participants in the scientific enterprise: in classes, in workshops and conferences, in professional societies, in research teams. This is what I mean by "inclusion." ("Full integration" is perhaps a better phrase.) As Princeton sociologist and demographer Marta Tienda has recently argued (Tienda, 2013), diversity is a necessary but not sufficient condition for inclusion. Inclusion often requires significant additional efforts to promote full integration of scientists from diverse backgrounds into teaching, research, and leadership positions.

Why Do Diversity and Inclusion Matter?

While there are many worthwhile areas to support increased diversity in our social institutions—education, the workforce, housing, policing—the Foundation's efforts to promote diversity have been tied closely to its broader mission to promote high quality research in science, technology, and economics. We have not tried to address diversity and inclusion issues in all areas but rather to use our resources to move the ball forward in areas related to our mission. The inequalities there are striking. Blacks, Hispanics, Native Americans, and women are underrepresented as scholars, teachers, and practitioners in almost all of the fields where we make grants, both compared to their representation in the total U.S. population and compared to their representation among college and university undergraduates. They are also underrepresented in graduate and undergraduate programs in fields where the completion of an advanced degree is necessary to become college or university faculty and where such a degree is necessary to have a successful research career. Women, for instance, are 50.8 percent of the population and 56.4 percent of all students at 4-year colleges and universities, yet they make up only 30.3 percent of graduate students in the fields Sloan funds.[3,4] Similarly, while Hispanics/

2 The Foundation uses "underrepresented groups" to denote four populations historically and currently underrepresented in STEM fields: African Americans/blacks, Hispanics/Latinos, American Indians and Native Alaskans, and women of all ethnicities.

3 See National Science Foundation, National Center for Science and Engineering Statistics. 2015. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2015*. Special Report NSF 15-311. Arlington, VA. Available at thttp://www.nsf.gov/statistics/wmpd/.

4 The "fields Sloan funds" includes all science and engineering fields tracked by the National Science Foundation excluding psychology, communications, all social sciences except economics, and all biological sciences except biochemistry and biophysics. Hereafter in this piece, talk of minority repre-

Latinos are 17.4 percent of the general population and 14.8 percent of all undergraduates at 4-year colleges, they make up only 4 percent of graduate students in STEM fields. Blacks do even worse, making up 3 percent of STEM graduate students, even though they are 12.4 percent of the general population and 13 percent of undergraduates.

Why does it matter? Why support increased diversity and inclusion at all?[5]

First, diversity and inclusion in all dimensions is an important foundation for a vibrant and stable democracy.[6] Belief that one has a stake in our society, and thus in its continuation, requires belief that the institutions that bestow social status and economic security are equally open to all or, if not, can be made so through participation in the mechanisms of democratic self-governance. Diverse institutions that manifest and demonstrate this openness are thus necessary to the maintenance of the democratic social order. The Foundation's earliest support for expanding higher education of blacks (and, later, Hispanics, Native Americans, and women) reflected the view that a vibrant democracy depended on equal opportunity for all Americans and that equal *educational* opportunity, in particular, was necessary for the creation of a diverse workforce that would have a stake in maintaining our democracy.

Second, there is growing evidence that more diverse and inclusive classrooms can improve the quality of the educational experience, that diverse and inclusive research teams can lead to more creative and significant research results, and that a more diverse and inclusive workforce can lead to increased productivity. Harvard economists Richard Freeman and Wei Huang, for example, recently analyzed 1.5 million scientific research papers written between 1985 and 2008. Their analysis revealed that paper co-authored by researchers of different ethnicities had higher citation counts and other impact factors than papers authored by teams of a single ethnicity. (Freeman & Huang, 2015). A recent meta-analysis of 23 higher education studies concluded that college diversity is significantly positively correlated with cognitive development. (Bowman, 2010). A 2015 McKinsey study looking at proprietary data from 366 publicly traded companies found a positive linear relationship between ethnic diversity and firm performance, with a 10 percent increase in diversity associated with a 0.8 percent increase in pre-tax revenue.[7] These results, and others like them, suggest that a more diverse, inclusive STEM education and research workforce will produce better, more innovative science.

Third, the underrepresentation of minorities and women among STEM teachers, scholars, and practitioners itself creates a negative feedback loop that makes it difficult to increase diversity and undermines efforts to ensure that diversity leads to full participation in the classroom and the lab. An overwhelmingly white and male STEM workforce will have very different backgrounds with very different life experiences from a workforce with better representation of woman and minorities. This difference in background and life experience makes it more challenging for the members of the incumbent workforce to serve as models, mentors, and facilitators who can encourage more members of underrepresented groups to take STEM courses, go on to graduate school, or pursue a research or teaching career. Moreover, if women or minority scholars are insufficiently integrated into research teams, meetings, and conferences, this will further discourage diversity. Participation in such activities is crucial to reaping all the benefits of a scientific career and the lack of full inclusion necessarily makes scientific careers less attractive to the excluded. A non-diverse and non-inclusive workforce, in other words, discourages diverse new entrants. This negative feedback loop needs to be broken.

Finally, U.S. demographic trends are making this situation worse, not better. The racial and ethnic composition of the population of the U.S. is changing rapidly, much faster than the racial and ethnic composition of the scientific and educational workforce. In 1970, non-Hispanic whites comprised 83.3 percent of the U.S. population. In 2010, they comprised only 63.7 percent of the population. Over that same time period, Hispanics more than tripled their representation in the U.S. population, moving from 4.6 percent in 1970 to 16.3 percent in 2010.

sentation in "STEM fields" or "STEM disciplines" should be taken to refer to this subset of science and engineering.

5 What follows is necessarily a brief treatment of the topic. For a much more thorough discussion of the value of diversity, see (Lewis & Cantor, 2016).

6 *Our Compelling Interests*, Earl Lewis and Nancy Cantor's recently published collection of scholarly works on the continuing importance of diversity to a prosperous society, contains several excellent works that speak to this issue.

7 See "Why Diversity Matters" http://www.mckinsey.com/business-functions/organization/our-insights/why-diversity-matters

Non-Hispanic blacks are also increasing as a share of the U.S. populace, although at a much slower rate, growing from 10.9 percent of all Americans in 1970, to 12.2 percent in 2010.[8] The U.S. Census projects that if these trends continue, non-Hispanic whites will represent only 43.6 percent of the total US population by 2040, while Hispanics will have swelled to 28.6 percent.[9] Yet despite these changes, blacks and Hispanics continue to be underrepresented among the recipients of advanced degrees in STEM fields. Latinos earned just four percent of the PhDs granted in science and engineering fields in the US in 2014. Similarly, blacks represented just 3.5 percent of all science and engineering PhD recipients. Underrepresented minority scholars account for less than five percent of full professors in science and engineering at America's large research universities.[10] This makes it both more important and perhaps more challenging to increase diversity among scholars, teachers, and practitioners in science, technology, and economics. Despite progress in many fields, the research and educational workforce upon which scientific progress depends is looking less and less like the U.S. population.[11]

The Sloan Foundation's History with Diversity and Inclusion

The 1950s and 1960s: Institutions Matter

The Alfred P. Sloan Foundation's first minority-focused grants were made in the 1950s, when issues of educational equity and racial injustice in education were at the forefront of the popular consciousness.[12] Launched when Mr. Sloan was still president of the Foundation[13], these initial grants focused on strengthening educational institutions that primarily educated black students. At the time, most blacks who went on to higher education went to a predominantly black college or university. The Foundation's first foray into promoting equality and diversity aimed to strengthen the educational and administrative resources of these institutions.

In 1953, the Foundation committed $1 million (2016$) to the Tuskegee Institute to help it build and equip its engineering school, expanding the educational offerings available to students. In 1959, the Foundation began making regular contributions to the annual fundraising drive of the United Negro College Fund, including a $4 million (2016$) donation in 1963. In an effort to help historically black colleges and universities (HBCUs) build their endowments and fundraising infrastructure, the Foundation launched an innovative matching gift program in 1965. The program created a $7.5 million (2016$) matching gift fund that provided a one-to-one match for every dollar raised by select HBCU's. Participating institutions, 23 in all, included Atlanta University, Spelman College, Langston University in Oklahoma, Southern University in Baton Rouge, and Alabama's Tuskegee Institute. The program was so successful—participating institutions raising some $67 million in response to the matching gift program—the Foundation re-authorized the program for another $7.5 million in 1967.

By the mid-1960s, support for these and other initiatives aimed at increasing educational opportunity for blacks had become a major part of the Foundation's grantmaking, generally. Indeed, in 1965, grants focusing on increasing educational opportunity comprised nearly 14.5 percent of all Foundation outlays.

The strategy underlying the Foundation's early minority-focused grantmaking might be called *institutions matter*. In an era when higher education was highly segregated, blacks, Hispanics, and other minorities underrepresented in STEM fields could only receive educational opportunities as good as the institutions that were open to them. Better educational opportunities and better educational outcomes would result from building strong institutions committed to successfully educating minority students.

8 Statistics taken from Tienda (2013).

9 See https://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf

10 See (National Center for Science and Engineering Statistics, 2015).

11 This difficulty is compounded by evidence that the U.S. as a whole may be less committed to promoting diversity and inclusion than it has been in the recent past. See (Tienda, 2016) and (Tienda, 1999)

12 *Brown v. Board of Education of Topeka*, the landmark U.S. legal case that ruled public school segregation unconstitutional and resulted in court-ordered desegregation and busing regimes throughout much of the American south, was filed in 1951, argued before the Supreme Court in 1952 and 53, and decided in 1954.

13 Alfred P. Sloan Jr. served as president of the Sloan Foundation from its founding in 1934 until 1962, when his chosen successor, Everett Case, took over as president. Sloan remained Chairman of the Board until his death in 1966.

Though it correctly identified and sought to address the pressing need to expand the educational opportunities available to African Americans, the *institutions matter* strategy, suffered from several weaknesses. First, strengthening predominantly *black* colleges left untouched the educational inequities suffered by women, Hispanics, and Native Americans. Second, while a focus on strengthening these colleges did extend educational opportunity, it failed to acknowledge the important benefits to be reaped by diversity and inclusion across all higher education institutions. Third, the Foundation assumed that the majority of blacks would continue to receive higher education at a predominantly black college or university. This was insufficiently optimistic. The rapid desegregation of educational institutions and the increased subsidization of higher education by federal and state government quickly expanded the educational opportunities open to African Americans. It was soon apparent that most African Americans would receive higher education outside the relatively small circle of historically black colleges and universities. To have a meaningful impact, a new strategy was needed.

The 1970s and 1980s: Money Matters

Even as the Foundation aimed to strengthen black-focused educational institutions in the 1960s, it was experimenting with a different model for expanding minority education and advancing diversity: direct support of minority students themselves. We might call this new model the *money matters* strategy. This strategy de-emphasizes the importance of building strong educational institutions (or better, that building strong educational institutions is properly the work of some other entity) and instead focuses on empowering minority students to take advantage of educational opportunities that were, in principle, increasingly open to them. What inhibits minority students from taking advantage of these opportunities, the theory goes, is the lack of available resources to do so. If you give minorities the resources to take advantage of these opportunities, they will.

Grants made under the *money matters* strategy largely took the form of fellowship programs that provided stipends to minority students. The Foundation's first fellowship program, launched in 1960, provided fellowships for black students entering medical school, an area that, at the time, showed very little representation of blacks. Initially supporting 10 students, the Foundation quadrupled the size of the program in 1965 and then expanded it again in 1969 when new Foundation president Nils Wessell announced that the Foundation would commit between $60 and $85 million (2016$) over five years to expand underrepresented minority enrollment in medical schools. Also in 1969, the Foundation launched a second major fellowship program, this one focused on expanding minority enrollment in graduate programs in business management. In 1974, the Foundation launched a third five-year program aimed at expanding minority enrollment in undergraduate engineering schools, and in 1980 it announced a fourth fellowship initiative, one focused on increasing minority enrollment in graduate public management and administration programs.

The Foundation's effort to boost minority enrollment in engineering programs deserves particular mention.[14] Led by Dr. Percy A. Pierre, then a Sloan program director and the Dean of the College of Engineering, Architecture, and Computer Sciences at Howard University, the Minorities in Engineering program resulted in several durable institutions that continue to advance minority inclusion in engineering today.[15] As a dean at a historically black university, Pierre saw that "too few African Americans were graduating from high school with knowledge of and an interest in engineering." (Pierre, 2015) This supply constraint redounded through the academic pipeline. Fewer qualified minority students led to fewer applications to undergraduate engineering schools, which in turn led to fewer baccalaureate degrees granted to minorities, fewer minority enrollments in graduate programs, fewer masters and doctoral degrees granted, and fewer minority engineers in industry, research, and the academy. Fixing K-12 math and engineering education, however, was too large a problem for the Sloan Foundation, with its limited resources, to address on its own. Meaningful change would require leveraging the influence of stakeholders in the private sector, education, philanthropy, and government. So under Pierre's direction, the Foundation set itself two goals. First, it would seek to convene a consortium of universities and other institutions devoted to increasing minority representation in engineering and in minority mathematics training

14 For an excellent and detailed history of the Foundation's minorities in engineering program and related efforts, see (Pierre, 2015)

15 The Foundation is grateful to Dr. Pierre who has had a continuing relationship with Sloan from the early 1970's to today. Pierre currently serves on the Advisory Committee to Sloan's Minority Ph.D. Program.

at the precollege level. Second, it would establish a national scholarship fund for undergraduate minority engineering students. Foundation grants in the former category helped create the National Action Council for Minorities in Engineering (NACME)[16] and MESA, the national engineering preparatory program.[17] Grants in the latter category were instrumental in the creation of the National Scholarship Fund for Minorities in Engineering and in the creation of the GEM consortium, a national network of corporations, government labs, and universities that provide graduate fellowships to minority engineering students.[18] The Minorities in Engineering program was notable not only for its influence, but also because its dual focus on building institutions (*institutions matter*) and providing direct fellowship support to students (*money matters*) represents the Foundation's shifting ideas about how to best advance the cause of diversity and inclusion.

The change in strategy from building institutions to empowering individuals was not the only change in the Foundation's minority-focused granting in the 70s and 80s. Whereas grantmaking in the 50s and 60s focused on increasing general educational attainment among minorities, these new efforts were narrowly tailored to specific academic fields historically related to the Foundation's wider mission. This narrowing of focus was a response to several factors, including rapidly increasing tuition costs and increased government support of minority undergraduate education. It was also during this new era that the Foundation expanded its vision beyond blacks to include other underrepresented minorities. In 1972 the Foundation made its first grant specifically targeting Hispanics, funding a program at the University of California Santa Cruz that prepared talented undergraduate students of Hispanic background for medical school. Also in 1972 the Foundation made its first grant aimed at Native Americans. The program, housed at the University of New Mexico School of Business, provided fellowships for indigenous students who wish to attend the graduate school in management.

The Foundation's fellowship programs in the 1970s and 1980s, however, raised a pressing issue. The Foundation did not have the resources to support a fellowship program at every college and university in the country. Its limited resources meant it would have to focus on some schools and programs and not others. The *money matters* strategy, taken by itself, provided no guidance on which schools to partner with.

1990s and 2000s: Mentors Matter

That guidance would come in the 1990s, when the Foundation drastically altered its minority-focused grantmaking. Spearheaded by new Foundation president Ralph E. Gomory, the new strategic focus began with the observation that some graduate departments were better than others at moving minority graduate students through the academic pipeline from enrollment to graduation. In such departments, it was observed, a passionate faculty mentor had taken a special interest in mentoring minority graduate students. If these mentoring "champions" could be identified, the Foundation reasoned, it could use its funds to enable them to take on more students. Identifying just such mentoring champions became the focus of the Foundation's new Minority Ph.D. program (MPHD). Launched in 1995 and led by new program director Ted Greenwood, the MPHD program's explicit focus was to increase the number of degrees granted in STEM fields to students of color through incentivizing students to join Ph.D. programs that were more successful than average in graduating minority Ph.Ds. The MPHD program augmented and extended the *money matters* strategy. It continued the Foundation's tradition of directly providing fellowships to students, but restricted support to students in STEM graduate programs where a dedicated faculty champion (or better, a group of champions) had demonstrated an effective ability to graduate minority doctoral students. Over the next fifteen years, the Foundation supported, at one time or another, some 145 individual STEM departments in the natural sciences, mathematics, and engineering.[19] Between 1996 and 2011, more than 1700 minority Ph.D. students received support from this program and nearly 1,000 completed their Ph.D. Total outlays for minority grantmaking over the time approached $70 million (2015 US$)

Though the Minority PhD program was designed to support blacks, Hispanics, and American Indi-

16 The Foundation continues to work with NACME to this day. The organization serves as the primary administrative agent in the Foundation's Minority Ph.D. program and the Sloan Indigenous Graduate Partnership.

17 See mesausa.org

18 www.gemfellowship.org

19 As time passed, the MPHD program began to increasingly focus on support for graduate degree programs in engineering, where minority representation lagged badly behind some other STEM disciplines. By 2010, more than 40 percent of MPHD scholars were in engineering programs.

ans/Alaska Natives, this last group proved hard to reach. Despite our best efforts, few Native Americans were taking part in the program. So in 2003, the Foundation launched a second major minority-focused initiative, the Sloan Indigenous Graduate Partnership (SIGP), which took aim at the unique challenges and barriers that graduate school poses for indigenous students. Studies show that feelings of isolation are a common barrier to completion of graduate programs, both inside and outside the sciences. This is a particularly vexing problem for Native American graduate students. Since only 1.7 percent of the population is Native American and since most Native Americans (like most ethnic groups generally) will not go on to graduate study, it is nearly impossible for a graduate department or school to develop the sort of "critical mass" that is required to stave off feelings of isolation. Those institutions that had succeeded in attracting indigenous students in abundance—the various Tribal Colleges for example—often had weak or no graduate STEM departments. What was needed was a set of institutions that specialized in graduate STEM education for Native American students, institutions that were attractive enough to enroll a critical mass of Native American graduate scholars and yet rigorous enough to have high quality faculty capable of providing first class scientific education and training. The Sloan Indigenous Graduate Partnership aimed to support just such institutions. Strategy in hand, Greenwood explored which institutions had been successful in moving Native American students through M.S. and Ph.D. degree programs in STEM fields. That led him to Maria Teresa Velez, Associate Dean of the Graduate College at the University of Arizona and a passionate advocate and devoted mentor of Native students. Together, Greenwood and Velez developed plans to help the University of Arizona become a national leader in the education of indigenous students[20], and the institution became the first SIGP grantee in 2003. Since then, the SIGP has expanded and now partners with four institutions—the University of Alaska (Anchorage and Fairbanks campuses), the University of Arizona, the Montana University System (Montana State University, University of Montana, and Montana Tech) and Purdue University—to support four regional centers devoted to creating educational environments designed to encourage the successful education of Native American graduate students in STEM fields. The program is notable for its unique (at the time) focus on creating a supportive inclusive community in which student learning could be embedded and where students of Native American heritage could learn together, share and compare ideas, address common problems, and help one another rise to the challenges of graduate study.

Also during this era, the Foundation launched a program in the Public Understanding of Science & Technology. Started in 1996, the program's overall aim is to increase the public's understanding of the increasingly important role played in modern life by science and technology through the creating of engaging, high-quality books, films, plays, and radio and television programs.[21] Under the able leadership of Vice President and Program Director Doron Weber, the program has taken a particular interest in shining a spotlight on the often underappreciated accomplishments of women and scholars of color. While all the works supported by the Foundation over the past twenty years are too numerous to mention here,[22] a partial list is appropriate. Supported books include *Hedy's Folly*, about the life of famous actress and inventor Hedy Lamarr; and *Hidden Figures*, about the black female mathematicians and engineers who were instrumental in NASA's space program in the 1960s. In Film, the Foundation has supported *The Man Who Knew Infinity*, about Indian mathematician Srinivasa Ramanujan; *Path to Nuclear Fission*, about physicist Lise Meitner's work unlocking the secrets of nuclear fission; *Afronauts*, about Zambia's space program; and *Decoding Annie Parker*, about Dr. Mary Claire-King's groundbreaking discovery of how mutations in a particularly gene dramatically increase the risk of breast cancer. In television, the Foundation has supported such projects as *Africa: The Great Civilizations*, a six-part documentary set to air in 2017 about the scientific, technical, and cultural achievements of Africa's great civilizations; and NOVA's *Forgotten Genius*, about the life and work of the pioneering black chemist Percy Julian. In theater, the Foundation has commissioned and supported the production of *Photograph 51*, about Rosalind Franklin's unappreciated contributions to the discovery of the structure of DNA; and *The Explorers Club*, about a turn-of-the-century

20 It worked. Today, more Native Americans get their doctorates from the University of Arizona than from any other institution in the country.

21 In 2008, the program was expanded to include the Foundation's historic interest in economics.

22 Visit the Foundation's website at www.sloan.org for a comprehensive list of the works supported through the Public Understanding of Science, Technology & Economics program.

science society thrown into crisis over whether to admit a woman scientist to its ranks. These are only a few of the many films, television broadcasts, books, and plays about the extraordinary scientific and technical contributions made by women and scholars of color.

The Foundation's Public Understanding program not only supports artistic works *about* women and minority scholars, it also support work *by* women and minority artists, promoting gender and racial diversity from the Hollywood studio to the Broadway theater house. More than fifty women playwrights have received commissions through the Foundation's theater program over the past twenty years and more than a hundred female screenwriters, directors, and producers have received support through the Foundation's film program. The Foundation is also currently supporting a series of television and radio programs hosted by women scientists or scholars of color. These include PBS's *Science goes to the Movies,* hosted by Faith Salie and Heather Berlin; and PRX's *Transistor* podcast, hosted by astrophysicist Michelle Thaller, neuroscientist Wendy Suzuki, and biologist Christina Agapakis. From its inception in 1996 to today, few initiatives have done more to raise the profile of women and minority scientists in the public eye than the Foundation's public understanding grantmaking.

The Modern Era: Synthesis and Inclusion

In 2010, two years after I became President of the Alfred P. Sloan Foundation, I initiated an extensive review of the Foundation's Minority Ph.D. program.[23] The review was led by program director Elizabeth S. Boylan, an accomplished developmental biologist and faculty administrator who had spent twenty years successfully promoting diversity and institutional change, first at Queens College and then at Barnard. Boylan met with and solicited assessments from a host of stakeholders in the program, including Foundation staff, Trustees, supported students, and directors at the various departments supported by Sloan grants.

Taken together, the assessments counseled that the Minority PhD program should be reorganized around a new strategy, one supported by four insights gleaned from the Foundation's sixty-year history of promoting diversity and inclusion in STEM higher education.

Institutions matter: (1950s-60s) Minority students are more likely to succeed when embedded in institutions with a strong commitment to minority education.

Money matters: (1970s-80s) Minority students are more likely to succeed when they have access to resources that allow them to take advantage of educational opportunities available to them and when they may direct those resources to their most effective purpose.

Mentors matter: (1990s-2000s) Minority students are more likely to succeed when a committed mentor takes both responsibility for and pride in a student's educational achievements and excellence.

Community matters: (Sloan Indigenous Graduate Partnership, 2003-present) Minority students are more likely to succeed when they are members of a robust, thriving community of mutual support.

Put another way, the various strategies pursued by the Foundation over the years represented complementary—not competing—visions, visions that would be most effective when brought into synthesis with one another. The most effective grantmaking in support of increasing diversity in education is one that provides students with significant resources to deploy as they see fit, recognizes that minority students need the support of mentoring and other robust and vibrant institutional structures designed to help them succeed, and integrates them into their professional communities.

In pursuit of this new strategy, a revamped Minority PhD program now concentrates its efforts in a new direction, creating and supporting **University Centers of Exemplary Mentoring (UCEMs)**. These new centers, based at eight university campuses across the country, combine all the best elements of the Foundation's minority grantmaking over the years. As the name suggests, these new centers continue the Minority Ph.D. program's insistence that effective, engaged mentoring is a crucial component to success. And like the fellowship programs supported by the Foundation in the 70s and 80s, the lion's share of Foundation support goes directly to students in the form of fellowships and stipend support. In order to qualify for a UCEM grant, however, an institution must demonstrate

23 The Sloan Indigenous Graduate Partnership will be reviewed in 2017.

an institutional commitment to minority graduate education, including a commitment of significant university matching funds, demonstrated buy-in from STEM department chairs and faculty mentors, and support from high-level university administrators. What's more, UCEMs must develop a slate of minority recruitment and retention initiatives and create a host of professional development and educational support structures designed to foster a vibrant community integrated with their student and research colleagues of all ethnicities and genders to facilitate success. In addition to the above, UCEMs are also expected to track student progress during and after they complete their degrees, solicit student feedback, and use the collected data to evaluate and improve their efforts.

My own view of the efforts of some universities to promote diversity in graduate education can be summed up by the phrase "talk is cheap." I wanted the universities that we support to show their institutional commitment by committing their own resources (human and financial) to our efforts. In addition, I wanted to go well beyond "the numbers" to create a comprehensive program at each participating school that included student support, mentoring, career development, network development, the full participation of the students who we support in all of the educational, research, and social activities of their departments. That is, *diversity + inclusion*.

Using a competitive solicitation process, the Foundation reviewed and assessed dozens of UCEM proposals, selecting eight universities whose plans demonstrated a truly remarkable commitment to advancing minority diversity and inclusion in STEM graduate education. The selected universities were Cornell University, the University of California at San Diego, Georgia Institute of Technology, the University of Illinois at Urbana-Champaign, the University of Iowa, MIT, Pennsylvania State University, and the University of South Florida.

The Foundation assumes it will support these UCEMs for at least nine years, assuming they meet certain performance benchmarks, at which point it will re-evaluate the program. In addition to the UCEM grants, the Foundation has made several subsidiary grants to support the overall effort, including grants to facilitate collaboration between the UCEMs and a grant to create a mentoring network for minority scholars after they have completed their degrees and entered the workforce.

Though it is too early in the lifetime of the program to expect good data on outcomes, I am cautiously optimistic about the program's prospects. The new, revamped Minority Ph.D. program represents a synthesis of all the Foundation has learned in sixty years of grantmaking in this area. In my opinion, it is better positioned to succeed than any other Foundation minority initiative to date.

Diversity Unsiloed

While I am proud of the Foundation's commitment to diversity over the last six decades and especially proud of the changes made to the MPHD program to increase its effectiveness, I came to believe that we were missing a big opportunity by putting diversity in a separate program "silo" and not making it a goal of *all* of our research and education programs. I have implemented several changes to the Foundation's grantmaking policies and procedures that aim to ensure that the Foundation's commitment to diversity is expressed more broadly than just in the Foundation's grants to support graduate education for underrepresented groups.

Diversity goals should be pursued in all of our programs in all of their dimensions. All of Sloan's grantmaking programs are now required to take both racial and gender diversity into account, working with grantees to ensure that minorities and women are fully represented on research teams, in postdoc and fellowship awards, and at meetings and conferences. The Foundation's grant proposal submission guidelines now require all grant proposal to include an "Attention to Diversity" statement describing the efforts that a prospective grantee plans to take to ensure their proposed work is adequately inclusive. Many grant proposals have been turned back due an inadequate actions to structure a project to ensure inclusion of women and underrepresented minorities.

I also encourage all Sloan's grant programs, be they in science, technology, economics, energy, or public understanding, to make specific grants to promote racial and gender diversity in their respective fields. Recent grants support a minority fellowship program in the Sloan Digital Sky Survey, a diversity fellowship initiative for young researchers in the Deep Carbon Observatory, several major grants to Wikipedia to aid its efforts to increase the representation of women and minorities among its editors, and a grant to Harvard for an innovative program to prepare recent bachelor's degree recipients from minority groups for graduate study in economics. In our New

York City Initiatives program, the Foundation has made several major grants supporting educational efforts aimed at minority populations and women. These include the support for Cold Spring Harbor Laboratory's DNA Learning Centers[24], Cell Motion Laboratory's BioBus and BioBase STEM education programs in Harlem[25], a CUNY initiative to support summer laboratory experiences for undergraduates and to provide research support to early career faculty from underrepresented groups, and grants to the Center for Mathematical Talent at NYU to motivate and nurture mathematical talent among underrepresented groups in New York City high schools.

Lastly, while it had always been implicit in our programs, I have expanded our understanding of diversity and inclusion to explicitly include women and have opened our diversity efforts, long focused on science, technology, and engineering, to include economics, one of the Foundation's oldest interests.[26]

Conclusion

Looking over even this brief history—and there is much more to tell—I am struck by how the Foundation's minority-focused grantmaking represents, in microcosm, so many of the virtues the Foundation pursues in its grantmaking writ large. While we have kept true to the overall goal of promoting increased diversity and inclusion in science, engineering and economics education and research, particular initiatives were temporary and limited, allowing the Foundation to learn from its efforts. We changed strategies in response to changing circumstances and narrowed our focus over time in order to maximize the probability of meaningful impact. Self-evaluation and re-evaluation has been a constant part of our efforts, and the program has steadily improved through the frank and honest appraisal of our successes and failures. Lastly, the values underlying our minority initiatives have come to be reflected not just in one grant program but in every single grant we make. The story of the Alfred P. Sloan Foundation's minority–focused grantmaking is the story of a Foundation attempting to learn and do better; one flexible in its tactics, open to new ideas, but unwavering in its underlying commitment to a scientific enterprise whose benefits and challenges are open and welcoming to all.

– October, 2016

24 www.dnalc.org
25 www.biobus.org
26 As a field, economics suffers from a significant diversity problem. See, for example, (Bayer & Rouse, Forthcoming)

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2015 Grants by Program

About the Grants Listing

Grants listed in this report are divided into three types.

TRUSTEE GRANTS are grants for amounts greater than $125,000. All trustee grants are reviewed by an independent panel of experts and are presented quarterly to the Board of Trustees for approval.

GRANTS MADE AGAINST PRIOR AUTHORIZATIONS are grants in any amount made from funds set aside by the Board of Trustees to be used for specific purposes. Depending on the amount or subject matter of the grant, grants made against prior authorizations may or may not have been subject to external review by an independent panel of experts. For each authorization, the Foundation reports once yearly to the Board of Trustees about grants made against the authorized funds.

OFFICER GRANTS are grants for amounts less than or equal to $125,000. Depending on the amount or subject matter of the grant, officer grants may or may not have been subject to external review by an independent panel of experts. Officer grants made by the Foundation are reported to the Board of Trustees quarterly.

Grants listed herein are listed by program, then by grant type, then alphabetically by the name of the institution receiving the grant. Not all programs make grants of each type each year.

Sloan Research Fellowships

Program Director: Daniel L. Goroff

First established in 1955 by Alfred P. Sloan Jr., these $50,000 awards aim to accelerate scientific breakthroughs by providing support and recognition to outstanding early-career researchers in eight fields. Selected for their research accomplishments by an independent panel of senior scholars, the Sloan Research Fellows represent the next generation of leaders in the natural sciences, mathematics, and economics. Since the beginnings of the program nearly sixty years ago, some $392 million (2015$) has been awarded to more than 5,000 fellows, many of whom have gone on to esteemed careers. 43 Sloan Research Fellows have become Nobel Laureates; 16 have received the Fields Medal in mathematics; 16 Fellows have won the John Bates Clark Medal in economics; and 68 have been awarded the National Medal of Science. Hundreds of others have received notable prizes, awards, and honors in recognition of their major research accomplishments.

2015 Fellows

Baylor College of Medicine
Jeffrey M. Yau, NEUROSCIENCE

Boston College
David Geraghty, MATHEMATICS

Brandeis University
Shantanu Jadhav, NEUROSCIENCE

University of British Columbia
Stephanie Waterman, OCEAN SCIENCES

Brown University
James Hays, COMPUTER SCIENCE

California Institute of Technology
Viviana Gradinaru, NEUROSCIENCE
Mitchell Guttman, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Gregg Hallinan, PHYSICS
Heather Knutson, PHYSICS
Xinwen Zhu, MATHEMATICS

University of California, Berkeley
James Analytis, PHYSICS
Richard Bamler, MATHEMATICS
Helen Bateup, NEUROSCIENCE
Naomi Ginsberg, CHEMISTRY
Benjamin Handel, ECONOMICS
Lin Lin, MATHEMATICS
Polina V. Lishko, NEUROSCIENCE
Thomas Maimone, CHEMISTRY
Vivek Shende, MATHEMATICS

University of California, Irvine
Aaron Esser-Kahn, CHEMISTRY
Jennifer Prescher, CHEMISTRY

University of California, Los Angeles
Smadar Naoz, PHYSICS

University of California, San Diego
Shachar Lovett, COMPUTER SCIENCE
Paul Niehaus, ECONOMICS
Padmini Rangamani, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Andrea Tao, CHEMISTRY
Bradley Voytek, NEUROSCIENCE

University of California, Santa Barbara
Douglas McCauley, OCEAN SCIENCES

Carnegie Mellon University
Boris Bukh, MATHEMATICS
Raphael Flauger, PHYSICS
Ariel Procaccia, COMPUTER SCIENCE

The University of Chicago
Eric Budish, ECONOMICS
Jian Ding, MATHEMATICS
Magne Mogstad, ECONOMICS
Stephanie Palmer, NEUROSCIENCE

Cold Spring Harbor Laboratory
Michael C. Schatz, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY

Colorado State University
Amber Krummel, CHEMISTRY

Columbia University
John Cunningham, NEUROSCIENCE
Jennifer Hom, MATHEMATICS
Suresh Naidu, ECONOMICS
Tiffany A. Shaw, PHYSICS
Harris Wang, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY

Cornell University
Nandini Ananth, CHEMISTRY
Melissa Warden, NEUROSCIENCE
Amy Williams, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY

Duke University
Lindsey Glickfeld, NEUROSCIENCE

Georgia Institute of Technology
Danielle Dixson, OCEAN SCIENCES
Christopher Reinhard, OCEAN SCIENCES

Georgia State University
Hao Xu, CHEMISTRY

Harvard University
Ryan Adams, COMPUTER SCIENCE
Ariel Amir, PHYSICS
Tasho Kaletha, MATHEMATICS
Kang-Kuen Ni, PHYSICS

University of Illinois at Chicago
Neal Mankad, CHEMISTRY

University of Illinois, Urbana-Champaign
Ryan Foley, PHYSICS
Alison Fout, CHEMISTRY
Thomas E. Kuhlman, PHYSICS

Indiana University
Kevin Brown, CHEMISTRY

University of Maryland Center for Environmental Science
Alyson Santoro, OCEAN SCIENCES

University of Maryland, College Park
Jacob Bedrossian, MATHEMATICS
Mohammad Hafezi, PHYSICS
Vladimir Manucharyan, PHYSICS

Massachusetts Institute of Technology
Jörn Dunkel, MATHEMATICS
Emmy Murphy, MATHEMATICS
Bradley Pentelute, CHEMISTRY
Themistoklis Sapsis, OCEAN SCIENCES
Heidi L. Williams, ECONOMICS

University of Michigan
Christine A. Aidala, PHYSICS
Alan Boyle, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Prabal Dutta, COMPUTER SCIENCE
J. Alex Halderman, COMPUTER SCIENCE
Andrew Snowden, MATHEMATICS
Kai Sun, PHYSICS

University of Minnesota
Fiona Burnell, PHYSICS

New York University
Michael Halassa, NEUROSCIENCE
Jennifer Jacquet, OCEAN SCIENCES

University of North Carolina, Chapel Hill
James Cahoon, CHEMISTRY

Northeastern University
Ting Zhou, MATHEMATICS

Northwestern University
Danna Freedman, CHEMISTRY
Toru Shiozaki, CHEMISTRY

Ohio State University
Marcos Sotomayor, NEUROSCIENCE

Oregon Health & Science University
Brian J. O'Roak, NEUROSCIENCE

University of Oregon
Shannon Boettcher, CHEMISTRY
Michael Harms, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Michael Pluth, CHEMISTRY

University of Ottawa
Pascal Audet, PHYSICS

University of Pennsylvania
Zahra Fakhraai, CHEMISTRY
Jennifer Phillips-Cremins, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Aaron Roth, COMPUTER SCIENCE

Princeton University
Sébastien Bubeck, COMPUTER SCIENCE
Oleg Itskhoki, ECONOMICS
Greg Kaplan, ECONOMICS
Corina E. Tarnita, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Vlad Vicol, MATHEMATICS

Rice University
Wei Li, PHYSICS

University of Rochester
Michael Neidig, CHEMISTRY

Rutgers, The State University of New Jersey
Alyson Brooks, PHYSICS

Simon Fraser University
Ben Adcock, MATHEMATICS

University of Southern California
Ian Ehrenreich, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY
Peter Ralph, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY

Stanford University
Jennifer A. Dionne, CHEMISTRY
Hemamala Karunadasa, CHEMISTRY
Percy Liang, COMPUTER SCIENCE

Stony Brook University
Lukasz Fidkowski, PHYSICS

University of Tennessee
Karen G. Lloyd, OCEAN SCIENCES

University of Texas at Dallas
Michael Kesden, PHYSICS

University of Texas, Austin
Isil Dillig, COMPUTER SCIENCE

University of Toronto
Natalie Enright Jerger, COMPUTER SCIENCE
Artur Izmaylov, CHEMISTRY
Julie Lefebvre, NEUROSCIENCE
Jacob Tsimerman, MATHEMATICS
Daniel Wigdor, COMPUTER SCIENCE
Hau-tieng Wu, MATHEMATICS

University of Utah
Jonathan Chaika, MATHEMATICS

University of Virginia
Shane Davis, PHYSICS

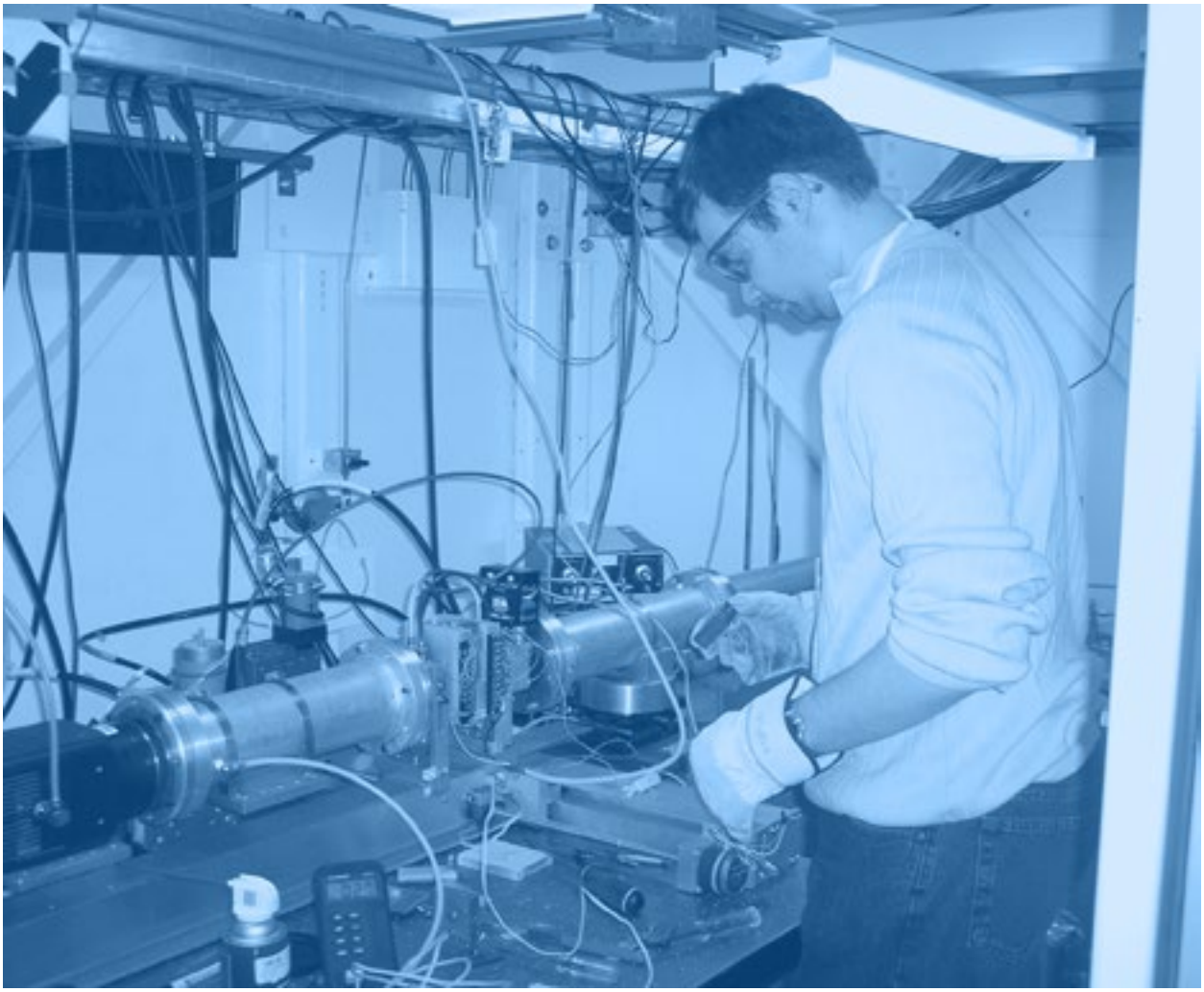
Washington University in St. Louis
Kater Murch, PHYSICS

University of Washington
Brandi Cossairt, CHEMISTRY
Emily Fox, COMPUTER SCIENCE
Shyam Gollakota, COMPUTER SCIENCE
Thomas Rothvoss, COMPUTER SCIENCE
Cole Trapnell, COMPUTATIONAL & EVOLUTIONARY MOLECULAR BIOLOGY

University of Waterloo
Pedro Vieira, PHYSICS

University of Wisconsin, Madison
Thomas Ristenpart, COMPUTER SCIENCE
Melanie Matchett Wood, MATHEMATICS

Yale University
Steve Chang, NEUROSCIENCE
Damon Clark, NEUROSCIENCE



STEM Research

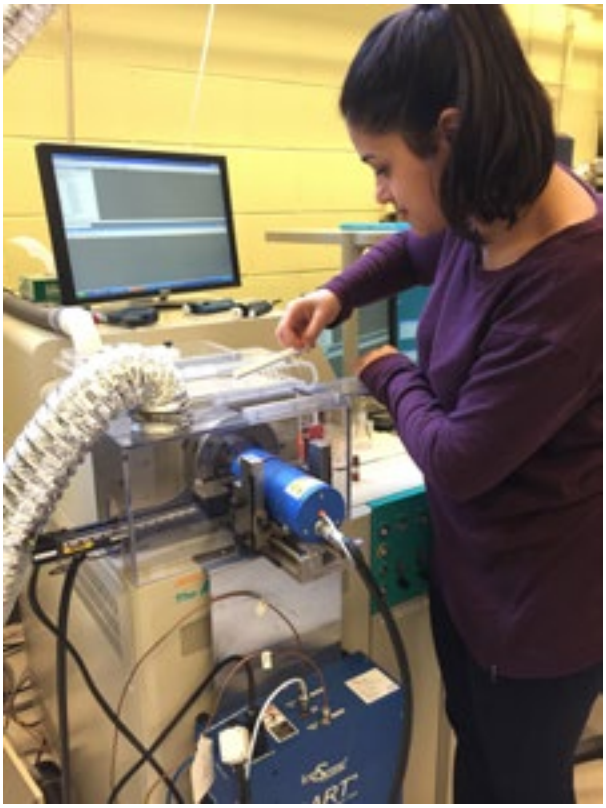
Chemistry of Indoor Environments

Program Director: Paula J. Olsiewski

The Chemistry of Indoor Environments program aims to grow a new field of scientific inquiry focused on understanding the fundamental chemistry taking place in indoor environments and how that chemistry is shaped by building attributes and human occupancy.

Grants in this program aim to:

- **Generate new knowledge** by directly supporting original, high-quality research to identify indoor chemical sources, characterize the chemical and physical transformations taking place indoors, and determine how indoor chemistry is shaped by building attributes and occupancy;
- **Develop a modeling consortium** to improve the cohesiveness of the community and its ability to integrate findings;
- **Build a thriving, multidisciplinary research community** of chemists; environmental, civil, and mechanical engineers; architects; atmospheric scientists; microbiologists; and environmental health experts that will endure beyond the program's timeline;



University of Toronto graduate student Ramina Alwarda performs a chemical analysis of materials found on indoor surfaces. (PHOTO BY SHOUMIN ZHOU)

- **Train the next generation of scholars** through educating and engaging graduate and postgraduate researchers;
- **Develop community-wide research protocols and norms.**
- **Advance capacity for discovery** through development of new tools for data collection, sampling, analysis, and visualization.

Trustee Grants

University of North Carolina, Chapel Hill

Chapel Hill, North Carolina

$200,000 over 24 months to conduct preliminary research on the impact of moisture in indoor chemistry.

Project Director: Barbara J. Turpin, Distinguished Professor

Recent advances in instrumentation have transformed our ability to study chemical reactions and analyze the composition of chemicals in the air. These advances provide an excellent opportunity to expand our understanding of the chemistry of indoor environments. This grant funds a preliminary study by Barbara J. Turpin, a professor in the Department of Environmental Sciences and Engineering at the University of North Carolina, Chapel Hill, of the impact of moisture on indoor chemistry. Turpin and her team plan to take samples from the air of 10 to 20 occupied homes, treat the samples with indoor oxidants (reactants) such as OH or NO3 radicals, and then monitor the reaction products using a variety of techniques. The study builds on Turpin's prior work demonstrating that aqueous organic chemistry alters the composition and effects of air pollution outdoors.

Turpin expects to produce at least two peer-reviewed articles based on the study, and she and her team will present their findings at national and international meetings. In addition, Turpin will prepare a short report that outlines important research questions and obstacles to be overcome for indoor air chemistry.

Deep Carbon Observatory

Program Director: Paula J. Olsiewski

The Deep Carbon Observatory (DCO) is a ten-year international collaborative research project that aims to radically transform our understanding of the quantities, movements, distribution, and properties of deep Earth carbon and its roles in the origin and limits of life, the creation of hydrocarbons, and the global carbon cycle.

Daniel Hummer (Carnegie Institution of Washington, USA) preparing equipment at one of the beamlines at the Stanford Synchrotron Radiation Lightsource, SSRL (in Menlo Park, California, USA) to conduct an experiment crystallizing titanium oxide minerals. (CREDIT: DANIEL HUMMER)

Over the ten years of this program, slated to end in 2019, grantmaking aims to create an international, multidisciplinary community of geologists, mineralogists, geophysicists, chemists, biochemists, microbiologists, and technologists that will:

- Benchmark the current state of our understanding of deep carbon;
- Develop an ambitious, intellectually rigorous research agenda;
- Cooperatively raise funding and execute that research agenda;
- Synthesize and disseminate findings to the larger scientific community and the public;
- Strengthen the geophysical research community through the training of the next generation of young geoscientists and through the development of new instruments, models, and analytical methods.

The Foundation's grants to the DCO focus on providing funds for organization, institutional infrastructure, data management, and early instrument development.

To learn more about the Deep Carbon Observatory, visit the project website at deepcarbon.net

Trustee Grants

University of California, Davis

Davis, California

$700,000 over 24 months to form a Deep Carbon Modeling Forum and to stimulate creation of a system of linked models that represent and explore the dynamics of the deep carbon system as a whole.

Project Director: Louise Kellogg, Professor

Funds from this grant support an effort by Louise Kellogg of the University of California, Davis to lead a multidisciplinary group of Deep Carbon Observatory (DCO) researchers in the development of the first stages of a Deep Carbon Earth Model that integrates existing geophysical knowledge with insights uncovered by the Deep Carbon Observatory. The project will involve representatives from each of the DCO's four scientific communities—Reservoirs and Fluxes, Deep Energy, Deep Life, and Extreme Physics and Chemistry—as they come together to craft a series of interoperable modules that can be used to model the quantities, movements, origins, and forms of deep Earth carbon. Though a fully functional, predictive model is the ultimate goal, the project promises to provide several ancillary benefits to the larger DCO effort, including identifying gaps in existing knowledge, increasing communication between the DCO's diverse communities, and establishing project-wide modeling protocols that can serve as the basis for both current and future modeling efforts.

University of California, Los Angeles

Los Angeles, California

$1,250,000 over 24 months to continue the activities of the Deep Energy community of the Deep Carbon Observatory.

Project Director: Edward D. Young, Professor

This grant provides two years of continued support to the Deep Energy community of the Deep Carbon Observatory. Researchers working in the Deep Energy community investigate the abiotic methane and hydrogen in the deep recesses of Earth. These compounds, when oxidized, release energy into the rocks around them, feed microbial life, and possibly contribute to humanity's store of energy resources. Recent discoveries, many of them by DCO researchers, suggest that such deep energy reserves are significantly more plentiful than science has imagined. Over the next two years, Deep Energy researchers will use both field-based investigations in oceanic and continental settings and lab experiments on fluid-rock interactions to shed light on a number of important scientific questions, including how to differentiate between abiotic and biotic hydrocarbons; the role of serpentinization and other hydrogen-generating reactions in the production of deep energy; how deep energy reactions mediate the form, quantities, distribution, and mobility of abiotic carbon and hydrogen; and the relationship between deep energy and deep microbial life. In addition, the Deep Energy team will begin collaborative work with other DCO communities to bring together insights from numerous disciplines in geoscience to create a functional four-dimensional Deep Carbon in Earth Model.

University of California, Los Angeles

Los Angeles, California

$1,250,000 over 24 months to continue to lead and coordinate the activities of the Extreme Physics and Chemistry community of the Deep Carbon Observatory.

Project Director: Craig E. Manning, Principle Investigator

The Extreme Physics and Chemistry (EPC) community of the Deep Carbon Observatory (DCO) is an international collaboration of geologists and geophysicists who have come together to transform our understanding of the unique physical and chemical properties of the 90 percent of Earth's carbon estimated to reside in the planet's high-pressure, high-temperature interior. EPC researchers study the diverse variety of forms deep carbon takes—solids, magmas, melts, low-density fluids—and examine the physical and chemical transformations carbon undergoes as it rises from the core to the surface and falls from the surface to the core. This grant provides two years of continued core support for the EPC as it moves toward completion of its ambitious research agenda.

Carnegie Institution of Washington

Washington, District of Columbia

$1,250,000 over 24 months to continue to lead the reservoirs and fluxes community of the Deep Carbon Observatory.

Project Director: Erik H. Hauri, Staff Scientist

Funds from this grant provide two years of continued support to the Reservoirs and Fluxes community of the Deep Carbon Observatory (DCO).

Questions about quantities and movements of deep carbon are fundamental to the DCO. How much carbon do the core, mantle, and deeper crust contain? Where is it? What mechanisms move carbon within and across Earth's layers, and what are the rates of these movements? Deep carbon's movements are also consequential for humanity, as when deep carbon erupts to the surface through volcanoes, or seeps out of the seafloor as hydrocarbons, or belches out when tectonic plates slip across one another, contributing to tsunamis. Now numbering more than 110 members, the Reservoirs and Fluxes community has matured into a set of networks addressing these and other questions, including uncovering the mysteries of carbon's most precious form, diamonds. Over the next two years, this international scientific network will focus on making important discoveries across five areas: the degassing of deep carbon through volcanoes; the degassing of deep carbon through tectonic and other diffuse processes; the origin, age, and depth of diamonds and the mineral inclusions within them; the fluid dynamics of carbon transport in volcanoes, and the global circulation of carbon between Earth's surface and core; and the chemical forms, mineral hosts, and reactions of carbons moving between reservoirs.

Supported activities include the establishment of the first global network for direct measurement of carbon flux, production of a database on eruptions and volcanic gases, the construction of an international reference collection of diamonds for research, and the development of new geodynamic models of deep carbon circulation.

Institut de Physique du Globe de Paris

Paris, France

$300,150 over 24 months to create and lead "Task Force 2020" to consider possible futures for the Deep Carbon Observatory after its first decade.

Project Director: Claude Jaupart, Professor

Though the Deep Carbon Observatory (DCO) was conceived as a 10-year effort, a midterm external review of the collaborative's achievements suggested that the DCO leadership explore the possibilities for continuing the collaboration after Sloan Foundation funding lapses in 2019. This grant supports the creation of a special task force to explore such options. Led by French geologist Claud Jaupert, the task force will outline practical requirements and consequences of post-2019 options for the

Researchers perform a test flight of a MultiGAS-equipped Matrix Quadcopter. The instrument, which measures atmospheric carbon, was used by DCO scholars on their "Trail By Fire" expedition, a 4,000-kilometer voyage from Peru to Chile that aimed to help quantify and model volcanic carbon emissions.
(PHOTO COURTESY OF THE DEEP CARBON OBSERVATORY)

Deep Carbon Observatory, exploring the ways in which the DCO might be continued, expanded, or wound down. It will scan the intellectual horizon for new research ventures; outline international cooperative programs that could build on the DCO community and expand its scientific reach; identify researchers and academic institutions that might participate in post-2019 activities; and search for institutions, funding bodies, and foundations that could provide financial support for post-2019 activities. It will carry out these activities through commissioned papers, visits with key stakeholders and institutions, and a trio of workshops, including special focus on the (now) younger scientists who will be in the prime of their careers during the decade of the 2020s. The effort represents a reasoned, prudent way to evaluate what to do, if anything, with the databases, websites, instruments, models, monitoring networks, and human capital created by the DCO's first decade of discovery.

Marine Biological Laboratory

Woods Hole, Massachusetts

$1,250,000 over 24 months to continue to lead and coordinate the activities of the Deep Life community of the Deep Carbon Observatory.

Project Director: Mitchell L. Sogin, Distinguished Senior Scientist

The Deep Life community of the Deep Carbon Observatory (DCO) is an international collaboration of researchers who have come together to identify and quantify interactions between deep life and deep Earth carbon, to transform our understanding of the processes that define the diversity and

Rhodochrosite (the red crystal pictured here) is a carbonate mineral first discovered in 1813 in the silver mines of Romania. In 2016, the Deep Carbon Observatory launched a "Carbon Mineral Challenge" to spur amateur naturalists to seek out undiscovered minerals, nearly 150 of which are predicted to exist. (CREDIT: SMITHSONIAN DIGITAL STUDIOS)

distribution of deep life, and to determine the environmental limits of deep life. This grant provides two years of support to the Deep Life community as it continues its research agenda. Over the next two years the community plans to launch five major field expeditions; conduct genomic-based studies of the diversity and function of deep life; measure and estimate presently unknown quantities like the magnitude of deep Earth biomass and the number of deep Earth endospores; and explore the molecular basis of microbial adaptation to extreme deep subsurface conditions. In addition, Deep Life community scientists will contribute to a DCO-wide modeling and visualization initiative and strengthen the field through the coordination of workshops, community meetings, and fellowships.

Rockefeller University

New York, New York

$1,500,000 over 50 months to support Jesse Ausubel's continued leadership on behalf of the Sloan Foundation of the Deep Carbon Observatory program initiated in 2009.

Project Director: Jesse H. Ausubel, Director

Funds from this grant continue support for Jesse H. Ausubel, Director of Rockefeller University's Program for the Human Environment, in his role as the Sloan Foundation's primary liaison to the Deep Carbon Observatory (DCO). As Sloan's representative at the DCO, Ausubel serves as a member of the DCO leadership, elicits grant proposals in support of the DCO's four research communities, oversees progress and reporting on the Foundation's approximately 30 active DCO grants, represents the Foundation's policies, priorities, concerns, and aspirations to the DCO leadership, and prepares periodic reports to the Foundation on the DCO's progress towards its decadal goals. Grant funds provide primary salary and administrative support for Ausubel and his team's activities through the anticipated completion of the DCO in 2019, where his work will focus on managing important late-stage DCO projects related to modeling and visualization, intellectual synthesis of DCO discoveries, dissemination of DCO results, and crafting stable institutional and intellectual legacies for the program after Foundation support ends in 2019.

Officer Grants

Johns Hopkins University

Baltimore, Maryland

$99,955 over 16 months to build an International Deep Earth Water Group for the Deep Carbon Observatory.

Project Director: Dimitri A. Sverjensky, Professor

Oregon State University

Corvallis, Oregon

$119,444 over 24 months to conduct the second field-based summer school of the Deep Carbon Observatory.

Project Director: Frederick S. Colwell, Professor

Rensselaer Polytechnic Institute

Troy, New York

$100,395 over 24 months to accelerate biophysical research in the Deep Life community of the Deep Carbon Observatory with a workshop and related development of a microscopy chamber capable of withstanding high pressure.

Project Director: Catherine Royer, Professor

Microbiology of the Built Environment

Program Director: Paula J. Olsiewski

This program aims to grow a new multidisciplinary field of scientific inquiry focused on understanding the microbial ecology of the built environments in which human beings work, live, and play.

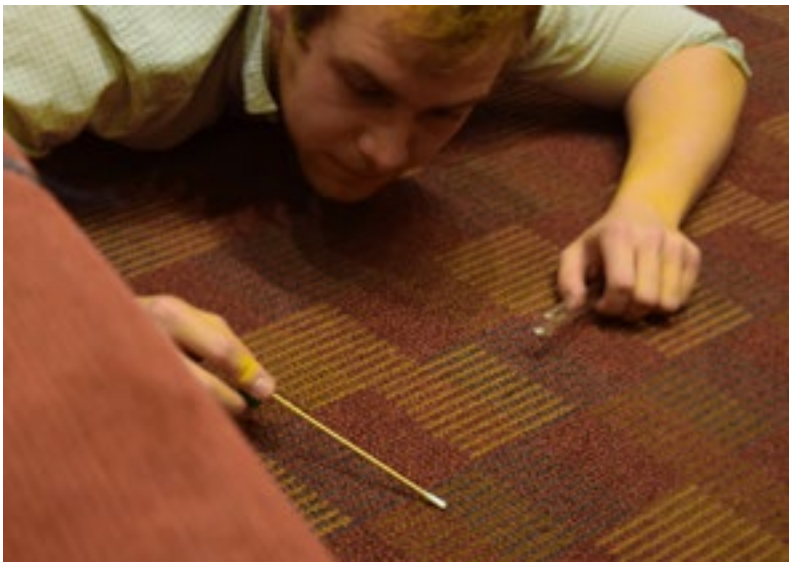
Grantmaking pursues a series of mutually reinforcing strategies.

- **Generate new knowledge** by directly supporting original, high-quality research on the microbial ecology of the built environment.
- **Build a thriving, multidisciplinary network and research community** of biologists, engineers, architects, and technologists that will endure beyond the program's timeline.
- **Train the next generation of scholars and practitioners.** An important component of this program is introducing new voices into the field and training the next generation of researchers.
- **Develop community-wide research protocols and norms.**
- **Advance capacity for discovery** through development of new instruments and tools for data collection, sampling, analysis, and visualization.
- **Attract dedicated funding from federal agencies** by demonstrating the existence of important gaps in our scientific knowledge and the potential for federal intervention to fill them.

Trustee Grants

University of Aberdeen Foundation, Inc.
New York, New York
$335,000 over 24 months to improve representation of the built environment fungi in UNITE, an open access database for molecular identification of fungi.
Project Director: Andrew Taylor, Senior Lecturer

This grant supports an initiative by Andy Taylor at the University of Aberdeen, in collaboration with Urmas Kõljalg at the University of Tartu in Estonia, that aims to significantly expand the UNITE database, a key resource used by mycologists in the genomic identification of fungi. The UNITE database contains genetic sequences of known fungi, which allows researchers to identify unknown fungi collected at field sites by matching the genetic sequences of collected samples to the master samples in the database. Unfortunately, the UNITE database lacks reliable standard sequence data on many of the fungi commonly found in indoor and built environments, which deprives researchers working on the microbiology of the built environment of a powerful tool for taxonomic identification. Over the next two years, Taylor and Kõljalg will target and sequence previously unsequenced fungal strains relevant to human and built environments, hold two sequence annotation workshops that aim to improve the quality of available sequence data, and develop metadata standards and protocols that will enable better inter-database comparison of collected fungal data.



University of Chicago undergraduate Miles Richardson swabs a carpet as part of a study of the microbial populations in college dorms. (CREDIT: MILES RICHARDSON, 2016)

University of California, Davis

Davis, California

$997,485 over 24 months to provide renewed support for the Microbiology of the Built Environment Network.

Project Director: Jonathan Eisen, Professor

Funds from this three-year grant support efforts by Jonathan Eisen at the University of California, Davis to provide key intellectual infrastructure support and services to the growing multidisciplinary community of researchers working in indoor microbial ecology. Through the Microbiology of the Built Environment network (microBE.net) Eisen organizes meetings and workshops, provides a hub for resource and information sharing, disseminates results and funding opportunities, aids in the dissemination of data collection and analysis standards and protocols, and helps bridge disciplinary boundaries by connecting researchers in biology, informatics, architecture, and the building sciences. Over the next three years, Eisen will continue the work of microBE.net, providing additional resources to the MoBE community in six thematic areas: antimicrobials in the BE; non-humans in the BE; extreme BEs; BE water systems; technical needs for the MoBE field; and general MoBE interests. Activities targeting each theme will include web development, meeting and workshop organization, social media, pilot research projects, creation and curation of open textbooks, development of a community-driven genome sequencing program, writing of scholarly articles on research and tool development, and continued development of the microBEnet blog with further recruitment of MoBE scholars to contribute to the development of modules for MoBE educational activities (e.g., college courses).

University of California, San Diego

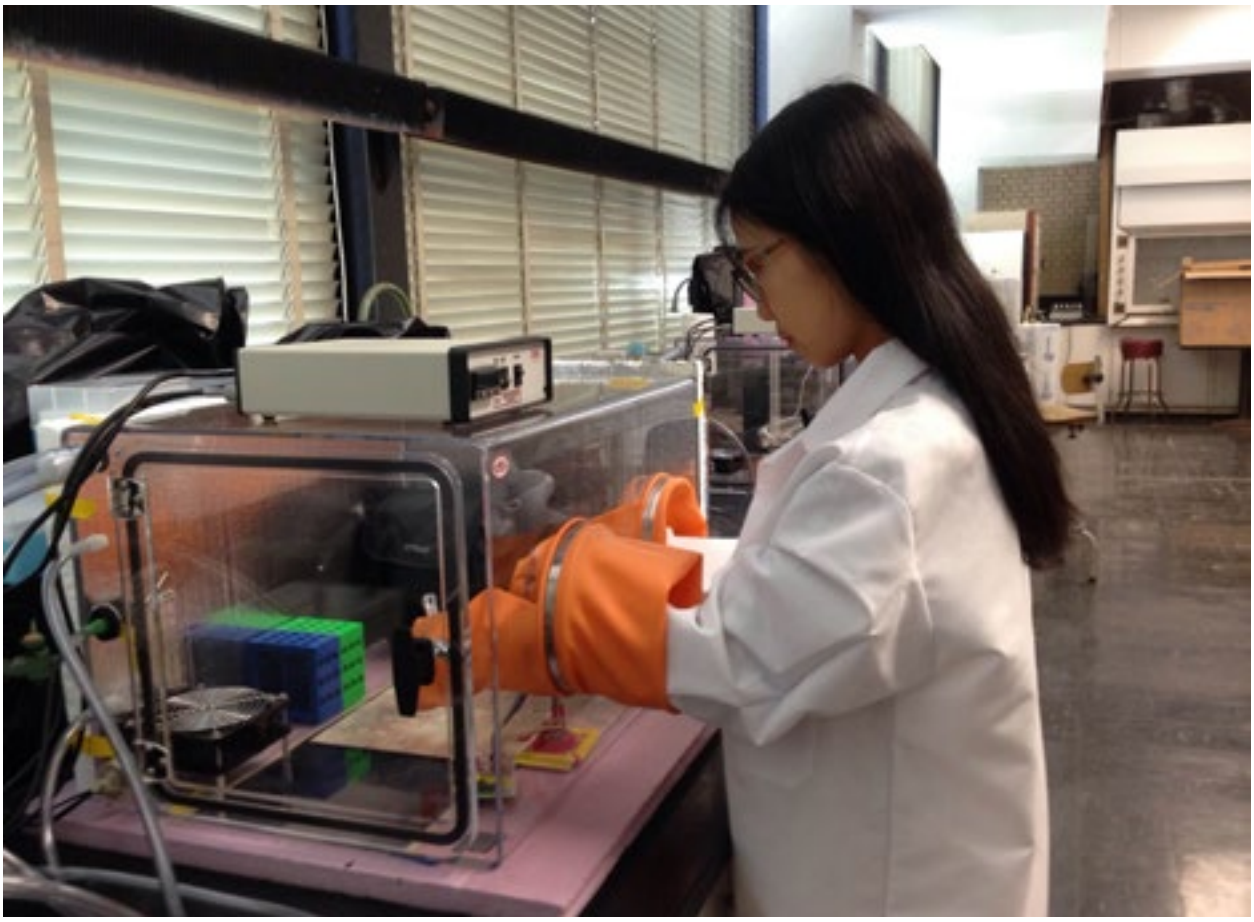
La Jolla, California

$326,700 over 24 months to develop improved software tools for studying the microbiology of the built environment that integrate sequence data, metabolic data, and building science data.

Project Director: Robin D. Knight, Professor

Researchers identify indoor microbes based on sequence data, i.e., analysis of DNA that is isolated from samples taken indoors. Though DNA sequencing has led to the discovery of a vast array of new indoor microbes, important gaps in our knowledge remain. We have an increasingly detailed picture of which microbes thrive indoors, but we don't know what those microbes are doing. Enter mass spectronomy, an analytical chemistry technique that identifies the types and amounts of chemicals in a sample based on molecular weight. By using mass spectronomy to analyze indoor samples for chemicals produced by microbial metabolism, researchers can peer into the actual workings of indoor microbial communities.

This grant funds a project by microbiologist Rob Knight of the University of Colorado and Pieter Dorrestein, professor of pharmacology at the University of California, San Diego, to expand the capabilities of two popular software platforms, QIIME and GNPS, to enable each to integrate sequence data, metabolic data, and building science measurements and permit researchers to easily perform DNA analysis and chemical data analysis on the same samples. The expanded systems will allow scholars to examine related microbial and metabolic processes directly in samples from the built environment, and in some cases to reanalyze samples already collected.



Dan Zhao, a PhD candidate in Environmental Engineering at the Illinois Institute of Technology, uses a "glove box." The box allows manipulation of collected samples without risk of contamination or the introduction of foreign microbes. (PHOTO COURTESY OF BRENT STEPHENS)

The University of Chicago

CHICAGO, ILLINOIS

$881,666 over 36 months to develop new knowledge about the metabolism of indoor microbial communities using experimental and modeling approaches.

Project Director: Jack A. Gilbert, Associate Professor

Recent field investigations of the microbiology of the built environment have demonstrated that the biological composition of indoor air and building surfaces is vastly more complex than previously thought. Very little is known, however, about the fundamental ecology of the microbes that colonize these locations. This grant supports efforts by a research team led by Jack Gilbert, associate professor in the Department of Ecology and Evolution at the University of Chicago, to develop new knowledge about the metabolism of indoor microbial communities using experimental and modeling approaches. The team plans to examine how different building surface materials, under variable temperature and humidity conditions, influence microbial growth, evolution, and survival and will develop a mechanistic model that can predict the succession and metabolism of microbial communities on surfaces.

Dr. Gilbert and his team will seed tile, laminate, wood, and metal surfaces with defined microbial consortia acquired from human skin, dog fur, and soil, and observe microbial community succession under various temperature and humidity conditions. Their observations will test a number of important hypotheses, including how humidity affects the diversity of metabolically active bacteria and fungi, whether taxonomic diversity of active microbes decreases over time, how air temperature affects cell grow rates, and how the bacteria-to-phage ratio in a given microbial community affects overall community size.

If successful, the project will result in new knowledge about bacterial succession in the built environment and provide a mechanistic model to

improve understanding of the metabolic activities of indoor microbes. The team plans to share their findings through publications in peer-reviewed journals, presentations at meetings and conferences, and through the use of social and traditional media. At least two postdoctoral fellows and two graduate students will be trained.

University of Oregon

Eugene, Oregon

$1,375,000 over 24 months to provide renewed support to the Biology and the Built Environment Center.

Project Director: Jessica Lee Green, Associate Professor, Director BioBE

This grant provides two years of continued support to the University of Oregon's Biology and the Built Environment Center (BioBE). Led by microbiologist Jessica Green and architect GZ Brown and founded with the assistance of a 2010 Sloan Foundation grant, the BioBE Center aims to develop a predictive science of the built environment microbiome by bringing together a multidisciplinary research team of microbiologists, engineers, architects, and building experts. Over the next two years, Center researchers will launch a number of research projects that attempt to expand our understanding of how ventilation, building structure, and daylight influence the composition and function of indoor microbial communities. Specific topics to be studied include how antimicrobial compounds influence the indoor microbiome and how that influence is mediated by building design, how restricting exchange with outside air affects community composition indoors, and whether earlier findings suggesting that design influences microbial dust communities are generalizable across building types. In addition to supporting the Center's research, additional grant funds support the Center's training and outreach activities designed to bring new talent into the field and disseminate research results widely among the scholarly community and public.

Yale University

New Haven, Connecticut

$256,641 over 24 months to conduct a pilot study to determine how microbial and chemical emissions from commercial air conditioners impact the microbiome of occupied spaces.

Project Director: Jordan Peccia, Associate Professor

Air conditioning (AC) systems cool and dehumidify air. The process deposits moisture on the cooling coils, creating an environment conducive to microbial growth. We know very little, however, about the microbes that grow on AC units or how these microbes affect and interact with the microbial populations of the buildings being cooled.

This grant supports Jordan Peccia, associate professor of environmental engineering at Yale, who will lead a multidisciplinary team in a pilot study examining how the microbial and chemical emissions of commercial air conditioning units impact the microbiome of occupied spaces. Over two years, Peccia and his team will characterize the bacterial and fungal communities present on the cooling coil surfaces of commercial air conditioners, estimate the microbial volatile organic compound (MVOC) emission rates from commercial AC units, and quantify the influence that AC emissions have on the indoor air and surface microbiome of occupied spaces. The team will initially sample 40 different commercial air conditioning units and use these samples to examine how microbial population structure is affected by a host of environmental variables, including outdoor climate, coil moisture, and coil temperature. They will then measure AC microbial emission rates and the characteristics of emitted microbes to study how these correlate with the surface and air microbiome composition in the buildings these units cool.

Grants Made Against Prior Authorizations

In March 2015, the Trustees approved the expenditure of up to $300,000 for small grants in support of the Foundation's Microbiology of the Built Environment program. The following grants were made against this previously authorized fund.

University of California, Berkeley
Berkeley, California
$119,611 over 25 months to develop methods to optimize recovery of RNA from indoor microbiome samples.
Project Director: Gary L. Andersen, Adjunct Professor

The University of Chicago
Chicago, Illinois
$80,000 over 12 months to organize a workshop of early career researchers studying the microbiology of the built environment.
Project Director: Jack A. Gilbert, Associate Professor

Colorado School of Mines
Golden, Colorado
$12,000 over 5 months to provide partial support for a symposium to recognize the scientific accomplishments of Sloan MoBE grantee Norman Pace.
Project Director: John R. Spear, Professor

New York University
New York, New York
$99,613 over 20 months to examine the microbial profiles of Amerindian homes in isolated settings with and without mestizo influence.
Project Director: Maria Gloria Dominguez-Bello, Associate Professor of Medicine

In October 2014, the Trustees approved the exenditure of up to $140,000 for grants that showcase the work of researchers studying the microbiology of the built environment and to inform the Foundation's Chemistry of Indoor Environments program. The following grant was made against this previously authorized fund.

University of Colorado, Boulder
Boulder, Colorado
$35,612 over 12 months to disseminate key results from the Sloan Microbiology of the Built Environment Program at Healthy Buildings 2015 America.
Project Director: Shelly L. Miller, Associate Professor

In December 2014, the Trustees approved the expenditure of up to $300,000 to fund small grants that foster scientific exchange between U.S. and foreign researchers studying the microbiology of the built environment. The following grants were made against these previously authorized funds.

University of Cincinnati
Cincinnati, Ohio
$110,000 over 17 months to support scientific exchange with research groups in Finland and neighboring countries.
Project Director: Tiina Reponen, Professor

Weill Cornell Medical College
New York, New York
$119,830 over 27 months to support an international consortium of researchers studying the metagenomics of subways and mass transit systems.
Project Director: Christopher E. Mason, Assistant Professor

In March 2015, the Trustees approved the expenditure of up to $720,000 to support six postdoctoral fellowships for outstanding young scientists or engineers studying the microbiology of the built environment. The following grants were made agains these previously authorized funds.

University of California, Berkeley
Berkeley, California
$120,000 over 24 months to characterize the microbial contribution to the volatile organic compounds (VOCs) in real residential environments through temporally and spatially resolved VOC measurements.
Project Director: Allen H. Goldstein, Professor

University of Colorado, Boulder

BOULDER, COLORADO

$120,000 over 24 months to elucidate beneficial pathways of Mycobacteriome Exposures in our Built Environment.

Project Director: Odessa M. Gomez, PhD Candidate

Massachusetts Institute of Technology

CAMBRIDGE, MASSACHUSETTS

$120,000 over 24 months to develop genomic assays targeted at the human-associated microbiome that can be used to monitor biological safety, enabling potable reuse of wastewater.

Project Director: Fangqiong Ling,

Roxana Hickey, a postdoctoral scholar at the University of Oregon's Biology and the Built Environment Center. As part of their research design, MoBE researchers take pains to ensure researchers do not introduce foreign microbes into the environments under study. (CREDIT: ROXANA HICKEY)

Officer Grants

Emory University

ATLANTA, GEORGIA

$10,165 over 7 months to conduct planning activities to organize a multidisciplinary workshop on the microbiology of legionella in the built environment.

Project Director: Ruth L. Berkelman, Professor

Mycological Society of America

LAWRENCE, KANSAS

$28,500 over 10 months to highlight ongoing studies of fungi in the built environment and increase understanding of fundamental processes that influence fungal communities at the 2016 annual Mycological Society of America meeting.

Project Director: Rachel I. Adams, Project Scientist

New York Academy of Sciences

NEW YORK, NEW YORK

$12,000 over 4 months to support dissemination of the proceedings of a conference entitled "Microbes in the City: Mapping the Urban Genome."

Project Director: Brooke Grindlinger, Executive Director

Rutgers, The State University of New Jersey

PISCATAWAY, NEW JERSEY

$49,724 over 16 months to determine how commonly emitted fungal Volatile Organic Compounds (VOCs) influence the growth and metabolism of other microbes in a shared indoor environment.

Project Director: Joan W. Bennett, Distinguished Professor

University of Toronto

TORONTO, CANADA

$116,035 over 11 months to support a series of dissemination and engagement activities for Sloan Microbiology of the Built Environment (MoBE) and Chemistry of Indoor Environments programs at Indoor Air 2016, as well as pre- and post-meeting workshops.

Project Director: Jeffrey A. Siegel, Associate Professor

Sloan Digital Sky Survey

Program Officer: Evan S. Michelson

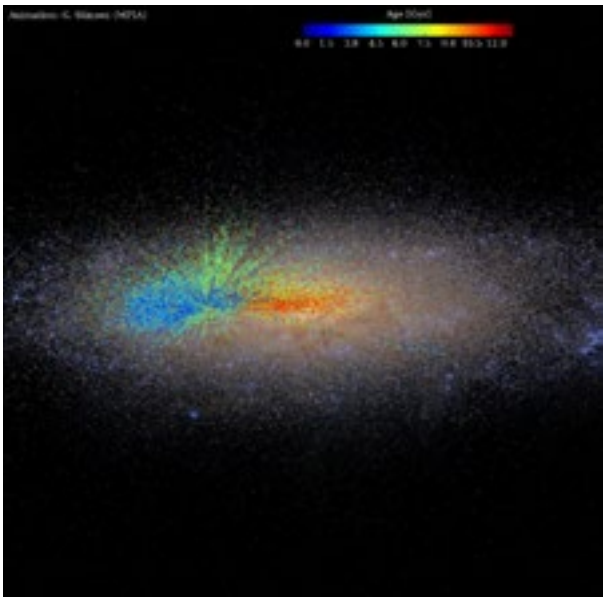
The Sloan Digital Sky Survey (SDSS) is one of the most detailed, highly cited astronomical surveys. It aims to expand our understanding of the large-scale evolution and structure of the universe, the formation of stars and galaxies, the history of the Milky Way, and the science behind dark energy. Since achieving first light in 1998, SDSS has mapped and catalogued more than a third of the night sky and is answering fundamental questions about the origins of the universe.

In cooperation with the Astrophysical Research Consortium, the Foundation has helped build and operate a pioneering telescope and associated instruments to observe and archive information on millions of stars, galaxies, quasars, and other cosmological phenomena. SDSS is distinctive within the astronomical community for its participatory, bottom-up scientific planning process, and it currently involves over 50 institutional members in the collaboration. The current fourth phase of SDSS (SDSS-IV) will continue the survey's rich tradition of cutting-edge data collection by partnering with a sister telescope in

A still photo from an animated flythrough of the Universe using SDSS data. This image shows our Milky Way Galaxy. The galaxy shape is an artist's conception, and each of the small white dots is one of the hundreds of thousands of stars as seen by the SDSS. (CREDIT: DANA BERRY / SKYWORKS DIGITAL, INC. AND JONATHAN BIRD / VANDERBILT UNIVERSITY)

Chile, allowing for observations of regions of the sky not visible from the Northern hemisphere and helping to fully realize the truly global nature of the collaboration. SDSS-IV now also includes programmatic activities to engage underrepresented minorities through its Faculty and Student Team (FAST) initiative.

All SDSS data is released to the public under open principles. More than 5,800 peer-reviewed papers have been written using SDSS data and those papers have in turn been cited more than 245,000 times in the wider literature. The most recent public data release contains data on the properties and spectra of close to a half billion stars and galaxies. SDSS is the only astronomy project supported by the Foundation and is its longest running scientific research program.



SDSS data superimposed on an artist's conception of the Milky Way. Red dots show stars that formed when the Milky Way was young and small, while blue shows stars that formed more recently, when the Milky Way was big and mature. The color scale shows how many billion years have passed since those stars formed. (CREDIT: G. STINSON, MPIA)

Trustee Grants

Astrophysical Research Consortium

Seattle, Washington

$700,000 over 40 months to increase the number of underrepresented minority students in the Sloan Digital Sky Survey IV (SDSS-IV) collaboration through the development and implementation of a Faculty-and-Student Team (FAST) program and a Research Experience for Undergraduates (REU) program.

Project Director: Michael Blanton, SDSS-IV Director

Funds from this grant support two projects that aim to increase the participation of underrepresented minority (URM) students in the Sloan Digital Sky Survey collaboration. The first, the Faculty and Student Team (FAST) program creates research teams led by a faculty member and comprised of at least one URM graduate student and/or two to three advanced URM undergraduate students. Each FAST unit (faculty and students) is subsequently linked with a research team at a formal SDSS participating institution; the research team will help integrate them into the collaboration, providing a kind of double mentoring system: the SDSS institution mentors the URM FAST team, and the faculty lead mentors the participating URM students on the team. The goal is to provide these URM students with training and guidance within SDSS, anticipating that they will eventually transition to an astronomy Ph.D. program at an SDSS member university.

The second supported project is a distributed summer program that will provide research experiences for minority undergraduates. The 10-week program, to be run by New Mexico State University, will bring interested URM students from non-SDSS institutions to the home institution of SDSS researchers to facilitate one-on-one mentoring and exposure to the global SDSS collaboration. In addition to their direct SDSS mentor, students would have regular virtual check-ins with the other participants, an in-person kick-off meeting, and a culminating research meeting, likely held in conjunction with a formal SDSS collaboration meeting.

Over time, the FAST and summer research programs have the potential to increase the participation of underrepresented minority doctoral students in astronomy programs nationwide.

Other STEM Research Grants

The Foundation occasionally makes research grants outside its normal grantmaking programs when a unique opportunity is presented to benefit society or advance the state of scientific knowledge. The following grants made in 2015 fall outside the Foundation's other grantmaking programs.

Grants Against Prior Authorizations

In March 2015, the Trustees approved the expenditure of up to $500,000 to fund exploratory projects in mathematics that directly align with other Sloan Foundation priorities. The following grants were made against this previously authorized fund.

Columbia University
New York, New York
$43,767 over 12 months to develop new statistical methods for improving the design, analysis, and efficiency of randomized experiments and observational studies of causal effects.
Project Director: Jose Zubizarreta, Assistant Professor of Business

George Washington University
Washington, District of Columbia
$8,882 over 5 months to sponsor speakers and graduate students at the next meeting of an annual and international conference on intelligent computer mathematics and mathematical knowledge management.
Project Director: Abdou Youssef, Professor

Institute for Advanced Study
Princeton, New Jersey
$121,543 over 13 months to broaden and deepen the community of researchers using differential privacy to study the mathematics of data.
Project Director: Rafe Mazzeo, Professor/Director of IAS/PCMI

University System of Maryland Foundation, Inc.
Adelphi, Maryland
$124,775 over 17 months to strengthen postsecondary mathematics education by developing strategic partnerships with mathematical leaders, funders, and clients.
Project Director: William E. Kirwan, Chancellor Emeritus & Regents Professor of Math

University of Michigan
Ann Arbor, Michigan
$10,000 over 12 months to foster the development and interaction of the scientific and professional communities working the analysis of extreme values and events.
Project Director: Stilian A Stoev, Associate Professor of Statistics

Texas A&M University
College Station, Texas
$20,000 over 14 months to co-sponsor, together with NSF, a workshop on evaluating the impact of inquiry-based learning in college mathematics.
Project Director: Ronald G. Douglas, Distinguished Professor

The Wolfram Foundation
Champaign, Illinois
$70,600 over 6 months to run a workshop on the semantic representation of mathematical knowledge.
Project Director: Michael Trott, Chief Scientist

STEM Higher Education

Education & Professional Advancement for Underrepresented Groups

Program Director: Elizabeth S. Boylan

This program aims to increase the diversity of higher education institutions and the work force in STEM fields through college and university initiatives that support the education and professional advancement of high-achieving individuals from underrepresented groups.

The program is divided into two major initiatives: The Minority PhD program and the Sloan Indigenous Graduate Partnership.

The **Minority Ph.D. program** (MPHD) aims to increase the number of underrepresented minorities who graduate from Ph.D. programs in STEM fields through the support of eight **University Centers of Exemplary Mentoring** (UCEMs). UCEMS are campus-based initiatives that provide scholarships, mentoring, and other professional support to minority graduate students in STEM.

Students eligible for scholarships through the MPHD program must self-identify as African American/black, Hispanic/Latino(a), American Indian, or Alaska Native, and must be U.S. citizens.

The **Sloan Indigenous Graduate Partnership** (SIGP) aims to increase the number of American Indian and Alaska Na-

Dr. Carlos Castillo-Chavez (center right), Professor of Mathematical Biology at Arizona State University, was honored with a 2015 Mentor of the Year Award at the 22nd Annual Institute on Teaching and Mentoring. The award honors extraordinary mentorship by a faculty member of graduate students from underrepresented minorities. Chavez poses with two of his students, Anarina Murillo (left) and Arlene Evangelista (right) and with Dr. Elizabeth Boylan (center left), Sloan's Director of Higher Education programs. (PHOTO COURTESY OF DENISE ELLIS)

tive students who successfully complete master's or Ph.D. programs in STEM fields through the support of four regional centers. Each of the centers provides scholarships, mentoring, and other professional support to its students, and works cooperatively with the other centers to raise awareness of the opportunities that American Indian and Alaska Native students have for financial support and professional development, all enhancing their aims to succeed in STEM graduate programs.

Students supported through the MPHD and SIGP are known as "Sloan Scholars."

Management operations of the MPHD program and the SIGP are conducted by the National Action Council for Minorities in Engineering (NACME). Partnerships also exist with two other organizations: the Southern Regional Education Board which has been sponsoring the Institute for Teaching and Mentoring that offers professional development opportunities to current Sloan Scholars, and starting in 2015, the Social Science Research Council which will develop the Sloan Scholar Mentor Network.

In addition to the above, the Foundation makes a number of grants focused on initiatives that promote the professional advancement of women and underrepresented minorities who hold post-doctoral and faculty appointments in academic institutions.

Trustee Grants

Harvard University
Cambridge, Massachusetts
$1,594,609 over 60 months to increase both the number of minority students entering top Ph.D. programs in economics and economics-related fields and the diversity of the economics faculties and work force.
Project Director: Sheila Thomas,
Asst. Dean of Diversity & Asst Prof. of Medicine

This grant supports a project by Harvard University's Department of Economics, in partnership with the Graduate School of Arts and Sciences (GSAS) and economists in other Harvard schools (e.g., the Kennedy School of Government and the School of Public Health), to support 24 "student-years-worth" of post-baccalaureate training in mathematics and economics for very promising underrepresented minority (URM) students.

Resources available to students through the program will include a paid research assistant position with a participating Harvard faculty member, up to four courses per year of undergraduate or graduate coursework, access to one of the math boot camps taken by entering graduate students in Harvard's economics Ph.D. program, support for GRE preparation, travel funds to attend conferences; and peer and faculty mentoring.

The project aims to increase the number of Ph.D. graduates in economics and related fields by 8 to 10 percent, and to serve as a model for other universities and institutions interested in increasing the representation of minorities within economics or other scientific fields.

National Action Council for Minorities in Engineering, Inc.

WHITE PLAINS, NEW YORK

$2,000,000 over 36 months to provide $2 million for three awards to new University Centers of Exemplary Mentoring (UCEMs) in the Sloan Minority Ph.D. Program.

Project Director: Aileen Walter, Vice President, Scholarship Management

Funds from this grant support the establishment of three University Centers of Exemplary Mentoring: one at the Massachusetts Institute of Technology; one at the University of California, San Diego; and one at the University of Illinois, Urbana-Champaign. These centers will aim to increase the diversity of underrepresented minorities in STEM graduate education through providing fellowships, peer and faculty mentoring, professional development, and various other services to STEM graduate students from traditionally underrepresented groups.

Together, the three new grants will fund $40,000 scholarships to 61 Sloan UCEM Scholars over the course of three years. In addition, the three universities will provide full packages (tuition, stipend, fees) to these 61 UCEM Scholars and to 61 UCEM Institutional Match (IM) students. Additional funds will support a host of activities at the UCEMs aimed at helping minority students succeed in their graduate studies.

The National Action Council for Minorities in Engineering administers the program, disburses funds to the Sloan UCEM Scholars and universities, reports on student progress and finances, and monitors and enforces policies on student eligibility, nomination, expenditure rules, and time-to-degree expectations.

Southern Regional Education Board

ATLANTA, GEORGIA

$999,645 over 48 months to provide Sloan Scholars and program directors in its Minority Ph.D. Program access and services at the annual meetings of SREB's Institute for Teaching and Mentoring.

Project Director: Ansley A. Abraham, Director

The Doctoral Scholars Program (DSP) of the Southern Regional Education Board (SREB) sponsors the Compact for Faculty Diversity's Institute for Teaching and Mentoring (Institute), the largest gathering of minority doctoral students in the country. The yearly institute brings minority students together to help provide young scholars with the resources they need to succeed in graduate study and in their future careers in academia. In addition, the Institute provides scholars opportunities to meet one another, share knowledge, and discuss common problems and strategies to overcome them. The gathering is an effective and efficient gathering point for all those in the Sloan Minority Ph.D. (MPHD) program, including Sloan Scholars, program directors, program administrators, and faculty, as well as staff from Sloan and its administrative partners: the National Action Council for Minorities in Engineering and the Social Sciences Research Council. The number of Sloan participants has grown to over 15 percent of the more than 1,000 scholars who attend the Institute each year.

This grant provides four years of support to the Southern Regional Education Board to defray costs associated with hosting the Institute.

Grants Made Against Prior Authorizations

In December 2014, the Trustees approved the expenditure of up to $250,000 to provide support for conferences and workshops that share the Foundation's goals with respect to increasing diversity in STEM higher education and professions. The following grants were made against these previously authorized funds.

University of Iowa

IOWA CITY, IOWA

$105,000 over 4 months to increase the number of students from underrepresented groups who earn doctoral degrees in the mathematical sciences.

Project Director: Phil Kutzko, Professor

University of Tennessee

KNOXVILLE, TENNESSEE

$26,364 over 18 months to support the 2016 Blackwell-Tapia Conference providing early-career minority mathematicians with enhanced understanding of their field, networking with peers, and interactions with senior researchers.

Project Director: Kelly Sturner, Education & Outreach Coordinator

Officer Grants

American Association for the Advancement of Science

Washington, District of Columbia

$105,258 over 12 months to support a workshop of ~30 research university teams to improve the recruitment, retention, and success of URM graduate students in STEM by studying strategies employed by peer institutions in the context of the team's own challenges and aims.

Project Director: Shirley M. Malcom, Directorate Head

The Aspen Institute

New York, New York

$20,000 over 9 months to support a national Native youth engagement strategy to ensure Native youth have new access to resources and support that help them succeed in higher education, especially making graduate programs more of a reality.

Project Director: Erin Bailey, Executive Director

University of Southern California

Los Angeles, California

$99,284 over 16 months to hold a workshop to enhance African Americans' participation in engineering education and the profession using a strengths-based, pathway approach.

Project Director: John Brooks Slaughter, Professor of Education & Engineering

Syracuse University

Syracuse, New York

$5,000 over 5 months to support fifteen undergraduate female physics students in the northeast United States to attend the 2016 American Physical Society Conference for Undergraduate Women in Physics at Syracuse University.

Project Director: M. Lisa Manning, Associate Professor

The Science of Learning STEM

Program Director: Elizabeth S. Boylan

Grantmaking in this program aims to enhance the persistence and success of students in STEM majors and other undergraduate programs through the improvement of STEM pedagogies that incorporate evidence-based principles of how people learn and account for differences in achievement among student groups, e.g., race/ethnicity and gender.

Grants in this program support hypothesis-driven projects that are sensitive to the heterogeneity of STEM disciplines, attentive to differences in student demographics and motivations, and concerned with the dissemination of findings and the portability of lessons learned to other institutions. Projects that prepare students for graduate school in STEM and economics are of special interest at this time.

Trustee Grants

Council of Graduate Schools
Washington, District of Columbia
$141,472 over 13 months to develop an instrument for collecting information on the careers of STEM Ph.D.'s from matriculation to 15 years post-graduation.
Project Director: Suzanne Ortega, President

This grant supports efforts by the Council of Graduate Schools (CGS) to improve the ways colleges and universities collect data on the career pathways and outcomes of graduate students in doctoral programs. CGS will spearhead the development and dissemination of an instrument to be used by departments at colleges and universities to track the careers of those that graduate from their doctoral programs. In addition, it will provide universities with a framework for administering the surveys and analyzing responses. Unlike the data collected in the Survey of Doctorate Recipients and the Survey of Earned Doctorates, which are aggregated nationally, the CGS effort would be focused on data aggregated at the departmental and institutional levels and would help administrators and faculty improve individual graduate programs; enhance institutional services to graduate students; inform prospective and current graduate students about careers associated with particular degree programs; and increase the awareness of policymakers, funders, and the broader public about the professional and social contributions of doctorate holders—wherever their lives take them. Data collection is envisioned to continue for 15 years post-matriculation.

Grants Made Against Prior Authorizations

In October 2014, the Trustees approved the expenditure of up to $350,000 to fund small grants that promote innovation in and evaluation of curricular and teaching practices and that support projects that demonstrably improve persistence and the quality of learning for all STEM students. The following grants were made against these previously authorized funds.

American Association for the Advancement of Science

Washington, District of Columbia

$63,694 over 12 months to provide graduate students with the skills to produce and effectively use an annotated version of the primary literature in advanced undergraduate course.

Project Director: Melissa McCartney, Project Director

Public Understanding of Science, Technology, & Economics

Books

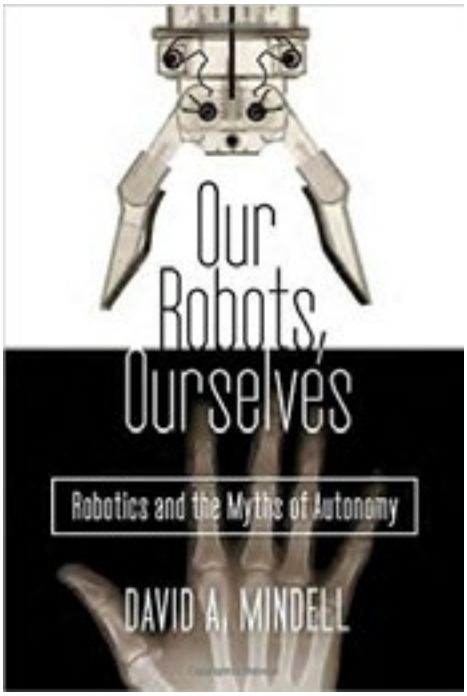
Program Director: Doron Weber

Books are critical entry points for the entire Public Understanding program. They allow us to delve deeply into any subject and uncover or synthesize new knowledge while imparting the profoundest understanding of issues and individuals. Books also frame important questions and concerns for the public in an enlightened and accessible context. The Foundation remains committed to books, both for their intrinsic value as a matrix of uniquely rich experience and deep learning, and for their adaptability to other media for broader dissemination and popularization.

The current book program began in 1996 and has supported over 100 authors. For the prior two decades, the Foundation supported the Sloan Series of Scientific Autobiographies in the 1980s and the Sloan Technology Series, begun in 1994, which was continued under the current program. Books such as Kai Bird and Martin Sherwin's *American Prometheus*, Richard Rhodes's *The Making of the Atomic Bomb*, Jared Diamond's *Collapse*, and Eric Kandel's *The Age of Insight* are among those that have been supported by the program. Recently published books include Stuart Firestein's *Failure: Why Science Is So Successful*, Julie Wosk's *My Fair Ladies: Female Robots, Androids, and Other Artificial Eves*, M.R. O'Connor's *Resurrection Science: Conservation, De-Extinction and the Precarious Future of Wild Things*, and David Mindell's *Our Robots, Ourselves: Robotics and the Myths of Autonomy*.

Grants

The Foundation made no grants in the Book program in 2015.



David Mindell's *Our Robots, Ourselves: Robotics and the Myths of Autonomy* was published on October 13, 2015 by Viking.

Film

Program Director: Doron Weber

The goal of the Film program is to influence the next generation of filmmakers to tackle science and technology themes and characters, to increase visibility for feature films that depict this subject matter, and to produce and disseminate new films about science and technology and about scientists, engineers, and mathematicians. Film is a universal language and an unrivaled medium for advancing public understanding of the scientific and technological enterprise and of the human beings at its center.

Launched in 1996, Sloan's Film program has awarded grants to over 500 film projects from some of the nation's most innovative filmmakers, and has created a film development pipeline of multiple program partners though which Sloan nurtures and develops individual projects. Over the past 15 years the Foundation has partnered with six of the top film schools in the country and established annual awards in screenwriting and film production, along with an annual best-of-the best Student Grand Jury Prize. The Foundation also supports screenplay development programs at the Sundance Film Institute, the Tribeca Film Institute, and Film Independent's Producer's Lab and Fast Track program. In 2015, Sloan added the prestigious San Francisco Film Society and the Black List to its screenplay development partners. Completed feature films developed by the Sloan pipeline include Matthew Brown's *The Man Who Knew Infinity*, Morten Tyldum's *The Imitation Game,* Michael Almereyda's *Experimenter,* Jake Schreier's *Robot & Frank,* Rob Meyer's *A Birder's Guide to Everything*, Musa Syeed's *Valley of Saints,* and Andrew Bujalski's *Computer Chess*. To gain distribution for Sloan films, the Foundation has expanded Coolidge Corner Theater's *Science on Screen* effort into a nationwide program that has awarded 94 grants to 47 independent cinemas, each of which shows at least one Sloan-supported film a year.

Trustee Grants

American Film Institute
Los Angeles, California
$315,000 over 36 months to encourage the next generation of storytellers to create more realistic and dramatic stories about science and technology, and to challenge stereotypes about scientists and engineers through film.
Project Director: Joe Petricca, Executive Vice Dean

This grant provides three years of continued support to the American Film Institute's (AFI) efforts to encourage young screenwriters and filmmakers

to write and produce compelling, engaging narrative films that explore scientific themes or have scientists, engineers, or mathematicians as major characters. AFI's program includes three annual award programs: a $25,000 award given to the best student film project that brings science and technology to life; a $10,000 annual screenwriting award given to the best science-themed script; and a yearly tuition scholarship worth $35,000 given to an incoming filmmaker with a background in the hard sciences who wishes to incorporate scientific themes in his or her filmmaking. In addition, AFI holds a seminar series where established actors, writers, directors, and producers talk to students about science and Hollywood, and provides access to working scientists to serve as mentors on student scripts.

University of California, Los Angeles

Los Angeles, California

$315,100 over 36 months for screenwriting and production of science and technology films by top film students.

Project Director: William McDonald, Chair

This three-year grant provides continuing support for efforts by the University of California, Los Angeles School of Theater, Film, and Television to encourage top film students to write and produce accurate, engaging films about science and technology. The UCLA program includes a yearly $10,000 screenwriting award given to the best student script that explores scientific themes or characters; a yearly $30,000 directing award given toward the production of a dramatic or comedic film about science or technology; and a yearly day-long colloquium that brings working scientists and researchers into the classroom to expose students to exciting new developments in science and introduce them to the narrative possibilities that science and technology offer the aspiring filmmaker. Additional grant funds pair student filmmakers with scientific mentors who advise students on the scientific content of their work and ensure that scripts depict science and the scientific endeavor accurately.

Carnegie Mellon University

Pittsburgh, Pennsylvania

$292,500 over 36 months to encourage top film students to write screenplays about science and technology.

Project Director: Robert Handel, Associate Professor of Dramatic Writing

This grant provides continued support for a program at the Carnegie Mellon University School of Drama (CMU) that exposes top dramatic writing students to science and technology and awards prizes to student screenwriters who write science- or technology-themed scripts. The CMU program includes a fall symposium that brings scientists to the drama school to introduce students to recent developments in a variety of scientific disciplines; a year-long screenwriting workshop that meets weekly and focuses on the challenges and opportunities posed by incorporating science into dramatic or comedic narratives, a mentorship program that pairs film students with working scientists to help them depict science accurately in their work, an annual screenwriting competition that awards $17,500 to the two best science-themed scripts submitted, and yearly showcases in Los Angeles and New York that bring student filmmakers into contact with leading producers, directors, and distributors in the film and television industry. Grant funds provide core support for these activities for another two years.

Coolidge Corner Theatre Foundation

Brookline, Massachusetts

$748,392 over 24 months to support the expansion of Coolidge Corner Theatre's Science on Screen program to art house cinemas nationwide.

Project Director: Katherine Tallman, Executive Director

Independent and arthouse cinemas participating in the Science on Screen program pair screenings of classic, cult, or documentary films with lively introductions by working scientists who discuss ways in which the film touches on science, technology, engineering, or mathematics. Past offerings have included a screening of the 1980s slapstick comedy Airplane! paired with a discussion of automation in aviation, a screening of Fight Club paired with a discussion of the psychology of aggression, and a screening of Soylent Green paired with a discussion of the future of the global food supply. The program is headed by Cambridge's Coolidge Corner Theater (CCT), which promotes the program within the arthouse cinema community, makes suggestions for entertaining film/discussion pairings, and administers small grants to participating theaters to promote screenings and recruit local scientists. In addition, CCT organizes a national "Science on Screen day" when all participating theaters hold coordinated screenings, and gives an annual presentation at the Arthouse Convergence,

On December 13, 2015, the Foundation and the San Francisco Film Society (SFFS) presented the inaugural SFFS/Sloan Science in Cinema Prize to *The Martian* at an event featuring producer Aditya Sood, author Andy Weir, and NASA scientist Christopher McKay. PHOTO BY PAMELA GENTILE/SFFS

an industry gathering of more than 600 arthouse and independent cinemas. Funds from this grant provide two years of continued support for the Science on Screen program, including funds to expand the number of participating theaters and improve the program's web presence.

San Francisco Film Society

SAN FRANCISCO, CALIFORNIA

$417,500 over 24 months to nurture, develop, and champion films that explore scientific or technological themes and characters.

Project Director: Noah Cowan, Executive Director

This grant provides two years of funding for a series of initiatives by the San Francisco Film Festival (SFFF) to support and nurture films and filmmakers that tackle scientific or technological themes or feature scientists, mathematicians, or engineers as major characters. Three distinct but interrelated activities are supported. The first is a filmmaker fund for screenwriters working on science and technology films, with one winning screenwriter the first year and two in the second. Each filmmaker will receive a $35,000 grant and a two-month residency at the Film House, SFFFS's newly built artist residency facility. In addition to residency, supported screenwriters will have their work presented in staged readings both at the Festival and at other events around the country. Second, SFFF will host an annual film prize for the best science- or technology-themed film submitted. Selected by an independent panel of filmmakers and scientists, the winning film will be announced in December at a high-profile screening event aimed at attracting critical notice. Third, SFFF will partner with The Black List, an influential annual industry survey of the best unproduced screenplays, to send a Sloan-supported screenwriter to its coveted annual screenwriting workshop.

The collection of activities represents an exciting new partnership for the Sloan Film Festival program, which builds bridges between the film industry and Silicon Valley's active and energetic science and technology culture.

University of Southern California

LOS ANGELES, CALIFORNIA

$373,612 over 36 months for screenwriting and production of science and technology films by top film students.

Project Director: Alan Baker, Associate Dean

Funds from this grant support a program at the University of Southern California School of Cinematic Arts that encourages top film students to write, direct, and produce films with accurate, high-quality scientific content. Grant funds support a number of interrelated activities at USC, including an annual production grant competition, which gives two $22,500 grants to help quality student scripts become films, two $15,000 screenwriting awards given to the best student science-themed scripts, and an annual $17,500 animation award for the best science-themed animation produced by a student animator. In addition, USC hosts an annual seminar that introduces students to the program and brings in working scientists to expose students to cutting-edge scientific research and discoveries and an annual screening night where winners' works are screened. USC also helps facilitate student interaction with industry professionals and the submission of science-themed works to film festivals and other dissemination outlets.

Sundance Institute

BEVERLY HILLS, CALIFORNIA

$500,000 over 24 months to support a science and technology film program at the nation's pre-eminent independent film center that includes screenwriting fellowships, feature film prizes, science and film panels, and associated outreach.

Project Director: Michelle Satter, Director

Funds from this grant provide two years of continued support for the Sundance Institute to promote

the production and distribution of high-quality narrative films with scientific or technological themes or characters. The Institute's efforts, which are primarily centered around the influential Sundance Film Festival, include five separate components:

- A commissioning fellowship of $25,000 to the screenwriter of a promising early-stage film project to be used to help usher the script toward production.
- An episodic story fellowship of $10,000 to the scriptwriter of a promising early-stage television project to be used to help usher the project toward completion.
- A lab fellowship which allows the director of a science-themed film project to participate in the Sundance Film Festival's prestigious production lab for up-and-coming filmmakers.
- A feature film prize, awarded annually at the Sundance Film Festival, for the best science or technology themed film submitted to the festival.
- A Science-in-Film forum held annually at the Sundance Film Festival that brings independent filmmakers together with working scientists in a moderated panel discussion about the opportunities and challenges posed by incorporating scientific and technological themes into narrative storytelling.

Fellowships include year-long support from the Sundance Institute, as well as dedicated stipends to enable filmmakers to hire scientific advisors for their projects.

Tribeca Film Institute

New York, New York

$800,000 over 24 months to build on the TFI Sloan Filmmaker Fund's success and to raise the profile of Sloan screenings, readings, and panels at the Tribeca Film Festival and year-round.

Project Director: Anna Ponder, Executive Director

The grant provides two years of continued support for a partnership with the Tribeca Film Institute in its continuing efforts to highlight excellent high-quality narrative films with scientific and technological themes. The TFI/Sloan Filmmaker Fund supports science-themed film projects in a wide variety of ways, giving grants of between $15,000 and $25,000 for screenplay development, optioning of literary material for adaption, and preproduction expenses like casting or location scouting. Additional postproduction grants are also available for science-themed projects, including funds for sound editing, negative cutting, and printmaking. In addition to grants to offset pre- and postproduction expenses, supported filmmakers receive help from scientific and industry advisors, to shepherd the project through production, and are mentored by TFI's insiders.

In addition to the TFI/Sloan Filmmaker Fund, TFI hosts several science-themed events at the annual Tribeca Film Festival, including a staged reading of screenplays by supported artists, a retrospective screening of a classic science-themed movie, a panel discussion of the screened film by scientists and industry professionals, and an industry reception that brings supported filmmakers together with leading Hollywood executives and distributors.

Tribeca Film Institute

New York, New York

$208,011 over 19 months to support the Sloan Student Grand Jury Prize administered by the Tribeca Film Institute to the best-of-the-best screenplay from Sloan's six film school partners.

Project Director: Anna Ponder, Executive Director

This grant provides two years of funding for the Sloan Student Grand Jury Prize. This annual prize is awarded to the single best student screenplay produced by a student from one of the Foundation's six film school partners (AFI, Carnegie Mellon, Columbia, NYU, UCLA, and USC) and supports the development of that script into a finished film.

The prize stimulates interest and excitement among the participating film schools and film students by awarding a "best-of-the-best" prize and by fast-tracking the winning project for development so it becomes a major career opportunity. The award package is $50,000 per year, of which $30,000 goes directly to the student filmmaker. The remaining $20,000 funds an industry mentor to guide the project, a committed science advisor, and other marketing (meetings, readings, events) and distribution efforts to maximize the screenplay's chances of production.

Radio

Program Director: Doron Weber

The Foundation supports original, high-quality programming on a range of radio programs tackling science, technology, and economics and seeks to increase both the quantity and the quality of science and technology coverage. Sloan grants started the science and technology desk at National Public Radio and at Public Radio International's *The World*; have supported feature radio series, such as the Peabody Award-winning *The DNA Files;* and sponsored science coverage on commercial radio, such as *The Osgood File*.

Current partnerships include support for the award-winning show *Radiolab,* two-time Peabody-winner *Studio 360,* Ira Flatow's perennially popular *Science Friday,* the Public Radio Exchange (PRX), the Institute for the Future's forthcoming *For Future Reference* podcast, Emmy-winning *Planet Money*, and WNYC's healthcare podcast *Only Human.* The Foundation also supports *LA Theatre Works* to record full-length science plays as part of a series called *Relativity*, broadcast on public radio. The recordings include over twenty plays originally commissioned by the Foundation's theater program.

Trustee Grants

National Public Radio, Inc.

Washington, District of Columbia

$550,000 over 24 months to support Planet Money's coverage of economics via multimedia journalism and enterprise radio reporting.

Project Director: Christopher Turpin, Senior Vice President

This grant provides two years of continued support for production of National Public Radio's *Planet Money* podcast. Grant funds will help produce in-depth economic content to be disseminated via the *Planet Money* podcast and blog and on NPR's *All Things Considered*, *Morning Edition*, *NPR One*, and *This American Life*. Additional funds will support the production of multimedia pieces to supplement and enhance the broadcast content on the web, a series of interactive "sound walks" that explore economic history, and several experiments in participatory journalism.

PRX Incorporated

Cambridge, Massachusetts

$500,000 over 24 months to support PRX in a three-pronged approach to expand science-themed audio content for radio broadcast, podcast, and video.

Project Director: Jake Shapiro, CEO

Funds from this grant support a three-pronged initiative by PRX, public radio's largest distribution marketplace, to expand science-themed audio for radio broadcast and podcasting.

First, PRX will continue to expand its Open Call for STEM stories, which last year generated more than 100 submissions from reporters and producers with compelling science stories to tell. Second, PRX will develop and support five new radio shows featuring women scientists and produced

In October 2015, the WNYC Health Unit launched a new, Sloan-supported health podcast, *Only Human*, that focuses on three areas: health policy and economics, medical science and discovery, and healthy living.

by women. Finally, PRX will incorporate science- and technology-themed episodes into its existing portfolio of popular programs, including *The Moth Radio Hour*, *99% Invisible*, *Theory of Everything*, and *Blank on Blank*, which collectively reach several million listeners.

With the runaway success of *Serial* in the past year, podcasts have hit a tipping point, and PRX is well positioned to harness this new energy and excitement. This project has the potential to engage an entirely new community of science storytellers, while advancing public understanding of science among the next generation of listeners.

Officer Grants

Institute for the Future
Palo Alto, California
$35,000 over 12 months to launch For Future Reference*, a 10-episode podcast series on consumer understanding of the latest advances in science and technology.*
Project Director: Eri Gentry, Research Manager

Television

Program Director: Doron Weber

The Foundation's goal with television is to tell stories, both historical and contemporary, about science and technology, and to portray the lives of the men and women engaged in scientific and technological pursuits. Television continues to be the most powerful medium in terms of audience, with public television, where most of Sloan Public Understanding funding goes, regularly delivering several million viewers per show.

Since 1996, Sloan's Television program has been helping to integrate science and technology—and profiles of scientists, engineers, and mathematicians—into the nation's regular programming. Foundation-supported shows such as PBS's *American Experience*, the longest running history series on television, receive support for highlighting the role of science and technology in society, and for broadening our view of the nation's history and of the central role of science, technology, and engineering in the country's narrative. The Foundation also supports *American Masters,* National Geographic Television, programs on *NOVA*, and economics coverage on *The NewsHour*. Recently aired television programs supported by the Foundation include the first season of PBS's scripted drama *Mercy Street*, *NOVA*'s "Making North America," the Charlie Rose Brain Series, and *American Experience*'s "Space Men." The Sloan-supported CUNY TV Series *Science Goes to the Movies* premiered in 2015 and will be broadcast nationally on PBS stations in 2016. The Foundation has a longtime interest in the under-appreciated role of women and minorities in science and technology, and is supporting work about such figures as Lise Meitner, Marie Curie, Rosalind Franklin, and Hedy Lamarr. The Foundation also supports television programs based on projects it has sponsored in other media.

Trustee Grants

Creative Visions
Malibu, California
$866,281 over 18 months to produce an American Masters' documentary for PBS on the remarkable life and scientific achievements of Hollywood actress, Hedy Lamarr.
Project Director: Trevor Hall, President

The grant funds a collaboration between PBS's *American Masters* series and Reframed Pictures, a new production company founded by actress Susan Sarandon, to produce a 90-minute documentary about Hedy Lamarr. The show, with Richard Rhodes as the primary technology advisor and Rhodes's Sloan-supported book *Hedy's Folly* as the primary text, will focus on Lamarr's pioneering

invention of frequency hopping—the basis for cell phones, GPS, and Wi-Fi technology—as well as Lamarr's colorful life and her renown as a glamorous Hollywood actress whose fame and beauty obscured her landmark contributions as an inventor.

CUNY TV Foundation

NEW YORK, NEW YORK

$481,100 over 11 months to continue production of the series Science Goes to the Movies *so there are enough episodes to initiate national distribution.*

Project Director: Robert Isaacson, Executive Director

NOVA's "Making North America," a three-part geological history hosted by paleontologist and Sant Director of the Smithsonian Institution's National Museum of Natural History Kirk Johnson examines how major natural events shaped North America's landscape. The series premiered on PBS stations nationwide in September 2015.

Science Goes to the Movies is a new public television program produced by the CUNY TV Foundation that reviews current movies and television shows from a scientific perspective. Topics discussed in early episodes include visualizing black holes, *Birdman* and the prevalence of hallucinations, and depictions of women scientists in the *Big Bang Theory*. Hosted by neuroscientist Heather Berlin and journalist Faith Salie, *Science Goes to the Movies* premiered in February 2015 and is reaching a growing audience through integrated use of broadcast, cable, web, and mobile platforms and has performed well in its native market of New York City. Funds from this grant provide production support for the show as it explores possible distribution to a national audience through PBS's Executive Programming Service, bringing the series to half the PBS stations in the country with a net audience of more than a million viewers.

WGBH Educational Foundation

BOSTON, MASSACHUSETTS

$2,500,000 over 24 months to produce and broadcast four new documentaries on the role of science and technology in history on PBS's The American Experience.

Project Director: Mark Samels, Executive Producer

Funds from this grant support the production of four science- and technology-themed documentaries to be broadcast by *American Experience*, the longest running and most successful history series on television. Supported episodes include "Nikola Tesla," a two-hour special about the visionary inventor of the alternating current electric supply system and radio control technology who forecast the Internet, solar power, and military drones. The documentary will draw on the recently published Sloan-supported biography by Bernard Carlson, which contains original research about Tesla's technological training and a wealth of detail about his endless inventions, both successes and failures. Also planned for production is "The Race Underground," about the great engineering challenge to build the first subway and transform urban transit told via the competition between brothers Henry and William Whitney, one in New York and one in Boston. A third episode, "The Aeronauts," tells the fascinating little-known tale of the Air Force researchers and test pilots who paved the way for the U.S. space program by testing the limits of the human body in the upper reaches of the atmosphere. The topic of the fourth show is yet to be determined.

Additional grant funds will support marketing, advertising, and promotion of the episodes, both on air and online; an active social media campaign; and targeted outreach to communities and organizations with a specific interest in these subjects.

Officer Grants

WNET

NEW YORK, NEW YORK

$100,000 over 24 months to produce at least three annual Sloan-related science, technology, and economics themed episodes of The Open Mind *for two years and to support enhanced outreach and promotion for the show to a national PBS audience.*

Project Director: Alexander Heffner, Host

Theater

Program Director: Doron Weber

The goal of this program is to engage leading playwrights, actors, directors, and producers to create and develop new works for the theater about science and technology and about scientists, engineers, and mathematicians, and to support the production of plays with dramatically engaging high-quality science content. Over the past fifteen years, the Foundation has developed a nationwide theater program with participants in many regions anchored by two acclaimed New York City partners—Ensemble Studio Theatre and Manhattan Theatre Club. This seminal program has backed such early Tony and Pulitzer Prize-winning works as *Proof* and *Copenhagen,* and is today recognized as the leading supporter of science plays in the country.

In addition to its two main partners, the Foundation recently awarded a pilot grant to the National Theatre in London and in the past has worked with New York-based Playwrights Horizons to develop and stage new works.

Sloan's theater program has provided support to plays such as Nick Payne's critically acclaimed *Incognito* and the Broadway hit *Constellations*, Frank Basloe's *Please Continue*, Deborah Zoe Laufer's *Informed Consent*, Nell Benjamin's *The Explorer's Club,* and Anna Ziegler's *Photograph 51.* To date the theater program has received over 2000 submissions for new plays, has commissioned more than 250 works, and has staged more than 60 plays in New York City alone, with dozens travelling to more than 30 theaters across the country and internationally.

(From left) DeLanna Studi and Tina Benko in the Primary Stages and Ensemble Studio Theatre/Alfred P. Sloan Foundation production of *Informed Consent* by Deborah Zoe Laufer, directed by Liesl Tommy, at Primary Stages at The Duke on 42nd Street. © 2015 JAMES LEYNSE. The play, inspired by a landmark court case between Arizona State University and a Native American tribe based in the Grand Canyon, follows one scientist's quest to answer the mysteries of genetic science and her own life.

Trustee Grants

Manhattan Theatre Club
New York, New York
$600,000 over 36 months to support the MTC/Sloan Initiative commissioning, developing, and producing new science and technology plays.
Project Director: Elizabeth Rothman, Sloan Project Manager

This grant continues support of an initiative by the Manhattan Theatre Club (MTC) to commission, develop, and produce new science- and technology-themed plays. Over the next three years, MTC plans to commission 15 science-themed plays from both emerging and established playwrights, provide dramaturgical support to commissioned artists, hold in-house readings of all completed scripts, stage three public readings, and produce one science-themed play at the theater's 47th Street mainstage. Plays are commissioned and scripts selected for production in consultation with an independent advisory board composed of distinguished working scientists. Commissioned playwrights receive between $10,000 and $20,000 for their work.

Grants Against Prior Authorizations

In December 2012, the Trustees authorized the expenditure of up to $425,000 for grants that aim to incentivize the production of more science and technology plays at the Manhattan Theatre Club by offering production support for qualifying plays. The following grants were made against this previously authorized fund.

Manhattan Theatre Club
New York, New York
$125,000 over 12 months production support for Manhattan Theatre Club's staging of Nick Payne's science-themed Incognito.
Project Director: Elizabeth Rothman, Sloan Project Manager

Officer Grants

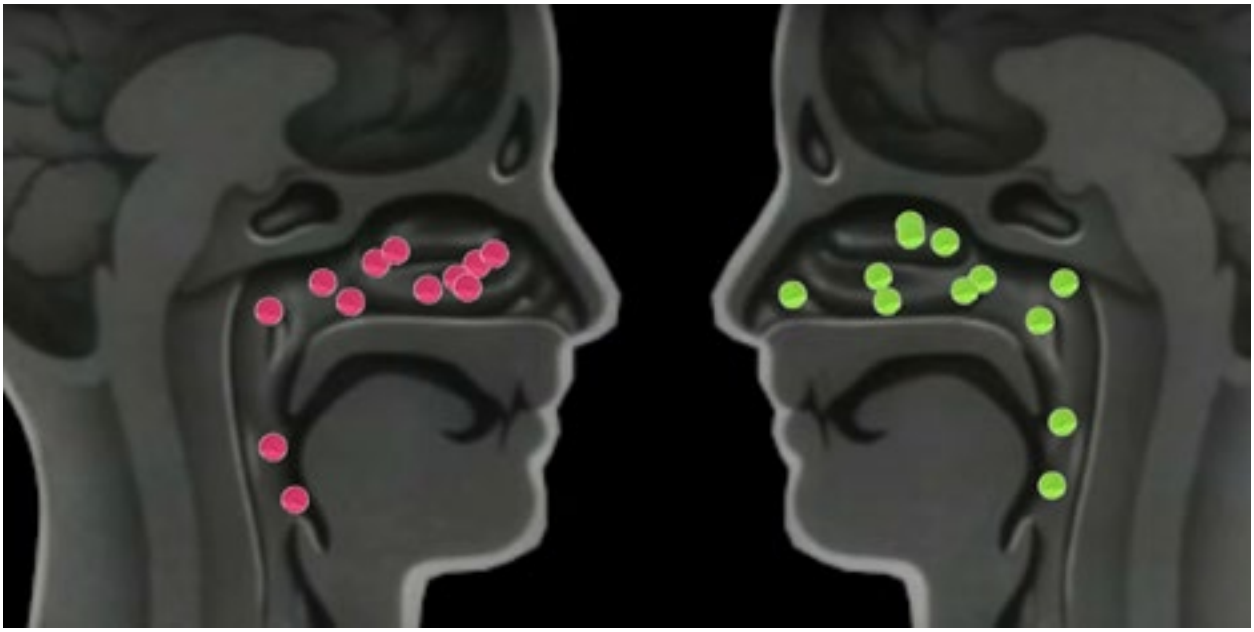
American Associates of the National Theatre
New York, New York
$83,938 over 13 months to support the development of a musical about John Snow, the father of epidemiology, and how he helped solve the cholera outbreak in 1850s London.
Project Director: Rufus Norris, Director

New Media

Program Director: Doron Weber

The Foundation sponsors innovative efforts using a range of media and other platforms to reach a broad, cross-cultural audience or to target specific segments of the public to enhance public understanding. These efforts may take the form of conferences, multimedia events, performances, eBooks, interactive games, science and arts festivals, and more.

The Foundation is a founding sponsor of the annual World Science Festival; has funded the Science Festival Alliance; has supported an exhibition on the mathematical significance of the artist Man Ray's work; has funded an interactive virtual chemistry set developed by the Chemical Heritage Foundation; has provided support to *The Secret Lives of Scientists,* a spin-off of the Sloan-supported NOVA ScienceNOW commissioned and funded exclusively by Sloan as a web-based experiment; and has provided support to other projects such as an interactive eBook developed by the New York Hall of Science on the science of DNA and its role in overturning wrongful convictions.



In 2015, filmmakers Flora Lichtman and Sharon Shattuck created two original short videos to illustrate new scientific findings. The still above is taken from a video based on a flu study published in *Nature* by Trevor Bedford, of the Fred Hutchinson Cancer Research Center, and colleagues. (GRAPHIC COURTESY OF FLORA LICHTMAN AND SHARON SHATTUCK)

Trustee Grants

Science Festival Foundation
New York, New York
$1,350,000 over 32 months to support the production and execution of the annual World Science Festival and related year-round live and digital activities in 2016, 2017, and 2018.
Project Director: Tracy Day, Chief Executive Officer

Launched in 2008 with the help of the Alfred P. Sloan Foundation, the World Science Festival is perhaps the world's premiere science festival, bringing first class scientists from all over the globe to New York City to lead the public in a weeklong series of panels, presentations, and events in celebration of all that is fun and fascinating about science. More than 50 panels and events are targeted at all ages and education levels, with recent panels devoted to such diverse topics as the science and history of beer-making, the use of electrical stimulation to improve cognitive function, and the effects of zero gravity environments on the human body. To increase its reach beyond New York City, the festival produces online and video segments and education material for science teachers to incorporate into their curricula. Funds from this grant provide continued support to the World Science Festival for another three years.

Officer Grants

National Geographic Society
Washington, District of Columbia
$48,539 over 2 months to produce a short video for The Science Philanthropy Alliance that illustrates its purpose and encourages philanthropic commitments to science funding for presentation with the Giving Pledge group on November 6, 2015.
Project Director: Pam Caragol, Executive Producer

Economics

Economic Institutions, Behavior and Performance

Program Director: Daniel L. Goroff

The Foundation's program on Economic Institutions, Behavior, and Performance supports rigorous and objective research projects on U.S. economic structure, behavior, and performance whose findings inform and strengthen decision-making by regulators, policymakers, and the public.

Grants made through this program span four subprograms:

- **Financial and Institutional Modeling in Macroeconomics**
  Projects in this sub-program study interactions between the financial sector and the real economy, specifically the role of banks, regulators, and other institutions. Research topics include financial frictions; heterogenous agents; intermediation; transaction costs; asymmetric information; regulatory coordination; risk measurement, capital requirements; credit ratings; interbank markets; microeconomic foundations; liquidity and default; maturity transformation; asset valuation; etc.
- **Behavioral and Regulatory Effects on Decision-making**
  Projects in this sub-program study households and individuals, specifically the of role "choice architecture" on their economic decision-making. Research topics include risk-taking and insurance markets; time inconsistencies and the annuity paradox; cognitive biases; behavioral applications to policy; experimental testing of nudges or other regulatory interventions; behavioral welfare economics; obfuscated markets; consumer finance; probabilities and perceptions of extreme events; etc.
- **Economic Analysis of Science and Technology**
  Projects in this sub-program study universities and groundbreaking industries, specifically regarding human capital development and applications of information technology. Research topics include labor markets for scientists and engineers; high-skilled immigration; patterns of scientific publication, collaboration, and intellectual property protection; the economics of digitization; and the social returns on investments in research and development.

- **Empirical Economic Research Enablers** Projects in this sub-program study economic researchers, specifically with regard to their needs, opportunities, incentives, and professional practices. Research topics include legal entity identifiers; data citation standards; identification and tracking systems for scholars; federal statistics; smart disclosure platforms for obfuscated markets; data and metadata management protocols; privacy and access to social science datasets; the replicability of empirical research; and the economics of knowledge contribution and distribution.

Trustee Grants

Benefits Data Trust

Philadelphia, Pennsylvania

$330,526 over 30 months to test neoclassical and behavioral accounts of government benefits uptake by running a randomized controlled experiment on food stamp program enrollment procedures.

Project Director: Matthew J. Notowidigdo, Associate Professor of Economics

People eligible for government benefits do not always make use of them. This goes for everything from health insurance subsidies to federal weatherization incentives to tax breaks for retirement savings to student loan forgiveness plans. For social scientists, particularly behavioral economists, the underutilization of such benefits is a vexing puzzle.

Working with the Benefits Data Trust, Matt Notowidigdo of Northwestern has secured records and permissions to run a randomized controlled trial on the uptake of benefits under the Supplemental Nutrition Assistance Program (SNAP). Although there have been studies of SNAP before, none have been randomized controlled trials. The study calls for over 30,000 eligible seniors to be slated by chance for one of three treatments: the control group gets nothing special; a "low touch" group will receive information about enrolling; and the "high touch" group will also receive assistance with preparing the necessary paperwork. Researchers will then analyze the collected data about who actually enrolls. Funds from this grant will support Notowidigdo and his team in executing the experiment and analyzing the results.

None of Notowidigdo's efforts aim to address potentially ideological questions about the existence or generosity of SNAP or social welfare programs in general. Rather, the aim is to generate empirical economic evidence that will help economists test different theories about what factors drive uptake of social safety net programs and how such programs can be administered effectively and efficiently.

California Institute of Technology

Pasadena, California

$283,935 over 21 months to conduct replication studies on economics papers after running prediction markets that subjectively assess the probability of confirmations.

Project Director: Colin Camerer, Robert Kirby Prof. of Behavioral Economics

This grant funds a project lead by California Institute of Technology economist Colin Camerer to attempt to replicate the findings of 18 seminal papers in economics. Working with the original authors, Camerer has selected highly influential, highly cited papers that all deal with between-subject treatment effects that appeared between 2011 and 2014 in either the American Economic Review or the Quarterly Journal of Economics. Camerer and his team have worked with the original authors to design the replication experiments and have agreed in advance about what kinds of findings will constitute a confirmation and which will not. His team will also run a prediction market where knowledgeable economic experts can trade bets on the likelihood that various results are confirmed by the new data. The project will thereby not only measure whether these 18 experimental results can be replicated, but whether and to what extent the community of economists is able to reliably predict such replication and thus whether expert confidence serves as a good indicator of future replicability in economics.

A collaboration on the sidelines of the 2015 National Bureau of Economic Research Summer Institute: From left, Johannes Schmieder, assistant professor of economics at Boston University; Stefano DellaVigna, professor of economics and business administration at the University of California, Berkeley; Attila Lindner, assistant professor of economics, University College London. (PHOTO BY MIKE LOVETT FOR THE NBER)

Carnegie Mellon University

PITTSBURGH, PENNSYLVANIA

$333,090 over 24 months to investigate how the availability and deployment of privacy enhancing technologies affect consumer behavior and welfare.

Project Director: Alessandro Acquisti, Professor

This grant funds efforts by Allessandro Acquisti at Carnegie Mellon University to examine, through laboratory, online, and field experiments, how Privacy Enhancing Technology (PET) can affect consumer behavior and welfare. Examples of PET tools include ad blockers like Ghostery, surveillance blockers like Tor, and cookie blockers like Beef Taco. Acquisti and his team will have PET software installed on the computers of some experimental subjects and then observe how their online behavior changes relative to a control group. They will then measure and analyze the subsequent differences in consumer behavior, like purchases or sites visited, as well as changes in the prices, products, or search results offered by websites and search engines to the two groups. The work promises to provide valuable new data on how concerns about privacy shape the way we conduct our lives online.

The University of Chicago

CHICAGO, ILLINOIS

$580,003 over 36 months to study experimentally the welfare economics of nudging and other behavioral interventions.

Project Director: John List,
Homer J. Livingston Distinguished

Behavioral economists tout examples of how small changes in the way options are presented can have large effects on the decisions people make. The term "nudging" refers to such "choice architecture" modifications that help, but do not force, people to behave more in line with how they wish they could. To count as a nudge, the behavioral intervention should be easy and inexpensive to disregard. So, for example, putting fruit at eye level is a nudge; banning junk food is not.

Large-scale experiments, both by academics and by governments, have shown that nudging can help people eat better, reduce their energy consumption, or save more for retirement. These are relatively straightforward applications, though. Others raise harder questions about who ultimately benefits, who loses, and by how much. For example, do people like being nudged? *Should* people like being nudged? All things considered, when does nudging actually make society better off? Does it matter much if people know they are being nudged?

This grant funds a series of experiments by University of Chicago economist John List to examine these and related issues. List's team has designed two large randomized controlled trials with almost 50,000 subjects in total, one focused on energy conservation and another on food choices. Along with measuring the direct effects of nudges, List will rigorously examine participants' decisions to opt in or out of being nudged, allowing him to estimate any associated welfare losses experienced by consumers.

The University of Chicago

CHICAGO, ILLINOIS

$214,690 over 16 months to elicit and study experts' prior predictions about the outcomes of experiments in behavioral economics.

Project Director: Devin Pope, Associate Prof. of Behavioral Science

What do behavioral economists really know? Lessons learned so far seem more about isolated, but intriguing, examples rather than coherent or unifying principles. What counts as accepted doctrine is based almost exclusively on empirical results about particular phenomena such as loss aversion, probability weighting, altruism, hyperbolic discounting, and social comparisons. One would expect, therefore, that experts would be rather good at predicting the outcomes of standard experiments about standard topics in behavioral economics. This grant funds a research project by Devin Pope of Chicago and Stefano DellaVigna of Berkeley that test that hypothesis.

First, Pope and DellaVigna will ask experts to forecast the effects of 17 different behavioral interventions or "nudges" in standard, simple, familiar, and carefully specified experiments. Second, they will run these experiments as described in a common setting. A large number of subjects will be asked to perform an effortful 10-minute task online. Each will be assigned to one of the 17 different framings, incentive structures, or other treatments. Just by keeping everything else equal except these behavioral interventions, the experimenters will be able to draw conclusions about the relative magnitudes and probabilities of various effects. Third, they will compare the expert forecasts with the experimental results. It is possible, of course, that all the predictions will turn out to be quite accurate—or not. In any case, such an exercise should help identify what behavioral economists do agree upon and, therefore, what we have learned from behavioral economics.

The University of Chicago

CHICAGO, ILLINOIS

$995,775 over 36 months to construct, calibrate, and compare models for analyzing how the financial institutions interact with the real economy.

Project Director: Lars Peter Hansen, Director

This grant funds three projects by the University of Chicago's Macro-Financial Modeling (MFM) initiative. Led by University of Chicago economist and Nobel laureate Lars Peter Hansen and Andrew Lo of MIT, the MFM initiative is a group of distinguished economists, business professors, and other finance experts who have come together to meet the challenges of modeling the complex interactions between the real economy and modern financial institutions. The first supported project is a summer school for graduate students which will bring young scholars from a variety of intellectual backgrounds to the University of Chicago to introduce them to macro-finanical modeling and to work on specific projects related to it. The second is an open call competition for new or crowd-sourced solutions to problems posed by the MFM initiative. The call will elicit the best thinking from outside the group, encourage innovative and creative approaches to established problems, and expand the reach of the initiative to those not yet involved in the program. The third project is the development and construction of an online platform for comparing and archiving various macro-financial models. This platform will allow MFM scholars to compare, contrast, and evaluate different models and will spur integrative work that may lead to the combination or improvement of existing models.

Cornell University

ITHACA, NEW YORK

$535,970 over 36 months to study the economics of socially efficient protocols for managing research databases containing private information.

Project Director: John Abowd, Professor

Any given research protocol entails a trade-off between privacy and accuracy. At one extreme, locking up data so no one can use it gives privacy but no accuracy or utility. At the other, fully open data provides plenty of accuracy and utility, but no privacy. In between are other protocols—like ones using fully homomorphic encryption, multiparty secure computation, or differential privacy—that provide differing combinations of accuracy and privacy. Together, one can imagine all these protocols forming a production possibility set. This grant supports a project by Cornell economist John Abowd to characterize the "efficient frontier" of such protocols. These are ones with the property that no other conceivable protocol could deliver more accuracy without sacrificing some privacy, or more privacy without sacrificing some accuracy. After assembling a library of such protocols, Abowd and his team will explore and measure public attitudes among these protocols and the tradeoffs,

helping us understand public preferences toward the tradeoffs between accuracy and privacy.

Harvard University

CAMBRIDGE, MASSACHUSETTS

$286,695 over 36 months to fashion fundamental concepts and models for behavioral economics based on theories of context-dependent choice.

Project Director: Andrei Shleifer, Professor of Economics

Behavioral economics catalogs examples of how people fail to act as naïve economic models say they should. In theory, such examples should lead to revised models of economic behavior that are more sophisticated, nuanced, and accurate. These have been slow in coming. To date, behavioral economists have been more concerned with classifications and applications than with foundations, representations, or explanations. Courses and textbooks tend to take up one anomaly or bias after another, without much of a conceptual or analytic framework to offer. Funds from this grant support a project by Harvard economist Andrei Shleifer to develop a theoretical framework that can systematically accommodate many of the anomalous behaviors detected by behavioral economists. Shleifer will attempt to do this through further development of "salience theory," which hypothesizes that certain facts or pieces of information can appear more salient or command more attention at the moment of decision. These salient facts are then overweighted by decision-makers relative to their nonsalient cousins, causing decision-makers to deviate from the rational behavior predicted by, say, expected utility theory. Grant funds will support Shleifer as he continues to develop salience theory and use it to incorporate the diverse insights of behavioral economics into satisfying, predictive models of human economic behavior. Topics to be explored include the role stereotypes and generalization play in decision-making, how being surprised affects salience, and how attitudes about what is or is not normal shape what people pay attention to.

Loyola University Chicago

CHICAGO, ILLINOIS

$207,000 over 25 months to catalogue the use of datasets and methodologies in empirical economic research publications.

Project Director: Svetlozar Nestorov, Assistant Professor of Information Systems

Professor Caroline Hoxby, professor of economics at Stanford University; Isaac McFarlin Jr., assistant professor of economics and education at the University of Florida; and William Spriggs, professor of economics at Howard University, chief economist of the AFL-CIO and NBER board member, talk following the 2015 Summer Institute's annual Martin Feldstein Lecture by Alan Krueger, professor of economics and public affairs at Princeton University and former chairman of the President Barack Obama's Council of Economic Advisers. (PHOTO BY MIKE LOVETT FOR THE NBER)

Empirical articles and the data they use have not always been carefully connected. That makes it hard to replicate findings, to reuse data, or to build on previous work rather than just duplicating it.

This grants supports the development and expansion of a new platform, DUOS (Dataset-Utilization Open Search), that links existing papers with the standard datasets and methodologies they use. Conceived by Svetlozar Nestorov of Loyola University, the system allows researchers, graduate students, and policymakers to find the published results of performing particular kinds of calculations on particular sets of survey data. Nestorov's initial work has focused on the Current Population Survey, the primary source of labor force statistics in the United States. Student research assistants have manually compiled hundreds of linkages between the survey and the published academic literature. This information constitutes a training set for machine-learning algorithms that, when sufficiently developed, will be able to scan the online literature and extract links automatically. Grant funds support the continuation of Nestorov's work and its expansion to other datasets, including the Survey of Income and Program Participation (SIPP) run by the U.S. Census, and the Panel Study of Income Dynamics (PSID) funded by NSF. Once developed, tested, and refined, Nestorov's machine-learning software for automating DUOS operations will be made freely available for use in fields besides economics.

University of Michigan

Ann Arbor, Michigan

$486,501 over 24 months to explore the relationship between behavioral nudges and intrinsic motivation by conducting field experiments.

Project Director: Brian Jacob, Professor of Education Policy & Economics

This grant funds research by University of Michigan economist and professor of education Brian Jacob, who has designed a randomized controlled trial to study the effects of behavioral interventions on enrollment in the Teacher Loan Forgiveness (TLF) program. The TLF is a federal initiative that forgives up to $17,500 in student loans to teachers who teach for five years in a school serving students from low-income families. The complicated, multi-stage qualification process for the program offers a unique opportunity to test how various interventions might work by randomly assigning applicants to different groups during the process and subjecting them to slightly different form designs, requirements, defaults, and choice architectures. The TLF thus serves as an excellent opportunity to study how to design federal benefits programs in ways that maximize their uptake. Funds from this grant will support Jacob and his research team as they conduct this two-year study.

National Bureau of Economic Research, Inc.

Cambridge, Massachusetts

$617,550 over 36 months to advance understanding of household financial behavior and policy.

Project Director: Brigitte Madrian, Aetna Prof. of Public Pol. & Corp Mgmt.

Funds from this grant continue operational support to the NBER Working Group on Household Finance, a group of researchers from economics departments, business schools, government, and industry who come together to work on questions about household balance sheets and financial decision-making. Under the leadership of Brigitte Madrian of Harvard and Steve Zeldes of Columbia, the group holds regular meetings, shares new developments in the field, identifies gaps in the research literature and promising ways to fill them, develops research projects, and convenes a well-attended biennial meeting on the economics of household finance. Additional initiatives planned for the next three years include a postdoctoral fellowship program to help engage the next generation of rising economists in the field of household finance, and a project focused on developing new methods, standards, and courses related to the use of administrative and government data.

Northwestern University

Evanston, Illinois

$258,536 over 36 months to improve estimates of how research investments translate into breakthroughs by scientific teams, and how scientific breakthroughs translate into eventual economic growth.

Project Director: Benjamin Jones, Professor of Strategy

Among big questions about the economics of science, two of the most important and challenging concern investments in research and development (R&D): How do the inputs to R&D map onto scientific breakthroughs? And how do the inputs to R&D map onto broader social returns? This grant funds efforts by Benjamin Jones of Northwestern University to make fresh progress on each of these questions.

First, Jones will focus on the productivity of scientific teams, investigating how the characteristics of individual team members contribute to overall performance in different contexts. We know little about what makes effective scientific collaboration. For theoretical work, perhaps the strength of the strongest researcher drives results; in the lab, perhaps the strength of the weakest researcher matters most; and, in other situations, it may be some kind of average over everyone. Jones will use output and productivity data on scientific team composition to try to understand how these different skills and training fit together to influence scientific productivity.

In a second effort, Jones will investigate the time delays between investments in and payoffs from R&D.

Starting with NSF and NIH grant numbers, he will link newly available microeconomic data that trace how long it takes in various fields for grants to turn into papers, for papers to turn into patents, and for patents to turn into adopted technologies. Jones will then use these data to calculate societal returns to government investment in science.

University of Pennsylvania

PHILADELPHIA, PENNSYLVANIA

$332,457 over 25 months to establish the Macro Finance Society as a catalyst, forum, and disseminator for research by macro and financial economists.

Project Director: Nikolai Roussanov, Associate Professor

Informal discussion at the 2015 National Bureau of Economic Research Summer Institute. From left, Marten Palme, professor of economics, Stockholm University; Evelina Lundberg, a Ph.D. candidate at Uppsala University; Bruce Meyer (back to camera), McCormick Foundation Professor at Chicago Harris; and Gabriella Conti, associate professor of economics at University College London. (PHOTO BY MIKE LOVETT FOR THE NBER)

Funds from this grant continue support to the Macro Finance Society (MFS) a group of prominent scholars in economics and finance who first came together in 2013 to advance the development of macroeconomic models that incorporate our best thinking about the interaction between the real economy and the financial sector. Grant funds will support a host of related activities over the next two years, including a series of biannual workshops and associated outreach activities, the development of a lasting repository for relevant data and code, the creation of a long-term financial sustainability plan for the society, and operational funds to offset the professional research and travel of members.

University of Pennsylvania

PHILADELPHIA, PENNSYLVANIA

$494,015 over 36 months to develop, analyze, and evaluate data science algorithms that probably protect privacy while avoiding overfitting and false discovery.

Project Director: Aaron Roth, Assistant Professor

This grant supports University of Pennsylvania computer scientist Aaron Roth in his work to develop, analyze, and evaluate "differentially private" algorithms for use in scientific discovery. First developed by mathematicians concerned about privacy, differentially private algorithms are ways of querying sensitive datasets. An algorithm or database query is "differentially private" if the results it returns would be provably the same even if an individual record were randomly replaced by another record in the queried dataset. Since the results such algorithms return do not depend on whether a given record is or is not included in the dataset, one cannot reverse engineer who is in the dataset from the results they generate. The privacy of the data is thereby protected.

As it happens, this privacy-protecting feature has uses outside the concern to protect privacy. Differentially private algorithms also prevent data mining and overfitting. Since differentially private algorithms produce the same results regardless of whether a given observation is randomly replaced by another, it is difficult to use them to craft results tailored to the particularities of the data you happen to have collected.

At present, however, differentially private algorithms are more exciting in theory than in practice. They tend to be laborious and slow. What's needed is further development and testing of such algorithms with scientific applications in mind. Dr. Roth is working on just such an approach, trying to develop practical applications of differentially private algorithms that are streamlined and reliable enough to be used in everyday scientific practice and analysis.

Stanford University

STANFORD, CALIFORNIA

$495,647 over 36 months to develop new empirical methods and use new "big data" resources for assessing the performance of Medicare and Medicare Advantage insurance plans.

Project Director: Jay Bhattacharya, Professor

This grant supports a research project by economists Jay Battacharya (Stanford Medical School),

Jon Levin (Stanford), Liran Einav (Stanford), and Amy Finkelstein (MIT) to use newly available datasets to compare the cost and performance of Medicare and Medicare Advantage to private insurance plans that cover similarly situated consumers. The team will examine a broad range of questions relevant to health care policy by comparing data on public insurance plan performance provided by the Center for Medicare & Medicaid Services with newly available data on private plan performance compiled by the Health Care Cost Institute. Issues to be examined include the differences in health care costs, services, and prices in public and private plans; what features of public or private plan structure account for these differences; and whether private insurance plans can or do deliver comparable outcomes to Medicare at lower costs.

Grants Made Against Prior Authorizations

In June 2013 the Board of Trustees authorized the expenditure of up to $750,000 to fund joint or exploratory small grants in economics, in particular to fund grants resulting from a joint initiative with the Russell Sage Foundation to identify unique research opportunities in behavioral economics. The following grants were made against this previously authorized fund.

Behavioral Science & Policy Association
Durham, North Carolina
$19,700 over 6 months to promote cooperation between behavioral researchers and policy practitioners.
Project Director: Kate Wessels, Executive Director

In October 2015, the Trustees approved the expenditure of up to $500,000 for grants that encourage the develoment and use of new data sources, particularly for research on the economics of science. The following grants were made against this previously authorized fund.

National Bureau of Economic Research, Inc.
Cambridge, Massachusetts
$20,000 over 12 months to launch an active and diverse study group on behavioral macroeconomics.
Project Director: Michael Woodford,
John Bates Clark Professor of Political Economy

Officer Grants

Duke University
Durham, North Carolina
$108,903 over 18 months to develop, test, document, and release methods for increasing data quality and decreasing disclosure risk in household datasets for public or restricted use.
Project Director: Jerome Reiter, Professor

Harvard University
Cambridge, Massachusetts
$124,994 over 30 months to strengthen a new postdoctoral program for interdisciplinary work on data science by including a position for a quantitative social scientist.
Project Director: Richard McCullough,
Vice Provost for Research

Institute on Science for Global Policy
Tucson, Arizona
$125,000 over 11 months to integrate empirical behavioral science and decision-making research into the design and evaluation of deliberative dialogue processes.
Project Director: George Atkinson, Executive Director

Massachusetts Institute of Technology
Cambridge, Massachusetts
$124,718 over 17 months to catalogue promising but underfunded opportunities for investing in scientific research.
Project Director: Maria T. Zuber,
Vice President of Research

RAND Corporation
Santa Monica, California
$20,000 over 9 months to promote research on behavioral economics and household finance by co-sponsoring the 7th annual RAND Forum on Behavioral Finance.
Project Director: Krishna Kumar, Director, Researcher

University College London
London, United Kingdom
$50,000 over 12 months to launch a carefully curated and edited blog that will make insights from microeconomic research more widely and popularly accessible.
Project Director: Richard Blundell,
David Ricardo Professor of Economics

Working Longer

Program Director: Kathleen E. Christensen

The goal of the Working Longer program is to expand and deepen scholarly, policy, and public understanding of the labor market activities of older Americans. The program also supports projects to identify ways in which institutional adjustments may facilitate employment of older Americans who need or want to work beyond conventional retirement ages. Grants support high quality research in specific areas of economics, including labor economics, public finance, and behavioral economics, as well as in related and complementary disciplines including demography, psychology and political science. Topics of interest include:

- **Human Capital**: *Occupation, Education, Cognition, and Health*
  How do the particular work history, occupation, cognitive abilities, and health of the individual impact employment for men and women after age 55?
- **Household Structure:** *Marriage, Divorce, Children, and Grandchildren*
  How do changes in the family at older ages alter labor force activities due to intergenerational transfers of money or in-kind resources, such as housing and care?
- **Finances:** *Resources, Pensions, and Financial Literacy*
  What roles do financial security, macroeconomic factors, and individual financial literacy play in work and retirement decisions?
- **Institutions**: *Social Security, Pension, Disability, and Health Insurance Regulations*
  How do the important and changing regulatory aspects of the Social Security system and other institutions relate to decisions to work longer and to retire?
- **Personnel Practices:** *Incentives, Sorting, Compensation, Job Design, and HR Practices*
  How can employers identify and implement practices that sustain or improve employee productivity as people age?

In addition to research, this program supports efforts to build and sustain a vital community of scholars focused on older workers and to effectively marshal resources in journalism and social media to advance the public understanding and engagement with issues related to the aging of the U.S. workforce.

Trustee Grants

Boston College

Chestnut Hill, Massachusetts

$432,630 over 36 months to build a robust and sustainable multi-disciplinary research network on aging and work.

Project Director: Jacquelyn Boone James, Co-Director of Research, Center on Aging & Work

Funds from this grant provide three years of support to the Boston College Center on Aging & Work for the operation and expansion of a multidisciplinary research network that links together scholars working on issues related to the aging work force. To date, nearly 90 scholars from 15 disciplines across 14 countries have joined the network, sharing the latest news, research results, data, and ideas for further scholarship. Grant funds will support expansion of the network's membership to 150 members globally, a survey to track member priorities, the launch of a summer research institute in 2016, a one-day member conference to be held at the annual meeting of the 2017 Gerontological Society of America, and the development of a long-term sustainability plan for the network.

Boston University

Boston, Massachusetts

$704,982 over 36 months to measure the work disincentives facing older Americans arising from America's major fiscal programs and provisions.

Project Director: Laurence Kotlikoff, Professor of Economics

This grant funds a study by Lawrence Kotlikoff of Boston University and Alan Auerbach of the University of California, Berkeley that will measure the work disincentives facing older Americans arising from almost 40 major U.S. fiscal programs and provisions. Kotlikoff and Auerbach will study the combined effects of all these programs to understand the marginal tax rate on income earned by older workers at different ages and to assess their combined potential to limit the work and incomes of the elderly. Using detailed data from several public datasets and advanced financial analysis software, the research team will test several hypotheses, including whether there are high median net marginal tax rates on the labor supply of the elderly at all levels of remaining lifetime resources; whether there exists a large dispersion in net marginal tax rates even holding remaining resources fixed, whether there are significant increases in sustainable living standards associated with the elderly working longer, and whether major impacts of the fiscal system on the elderly's labor supply can be reduced with revenue-neutral fiscal reforms that preserve fiscal progressivity.

University of California, Los Angeles

Los Angeles, California

$356,199 over 36 months to provide information on the labor market consequences for adult daughters and sons providing elder care to their aging parents.

Project Director: Kathleen McGarry, Professor

This grant funds research by UCLA economist Kathleen McGarry that examines how providing eldercare affects the labor market activities of adult sons and daughters. Using descriptive analyses, multivariate regressions, and structural modeling on data drawn from the longitudinal Health and Retirement Study, McGarry and her team will study changes in employment, hours worked, wages, and benefits (including health insurance and pension wealth) of adult caregivers in order to assess how caregiving activities affect financial well-being in later life. They will also draw comparisons across genders between the types of care, the number of hours of care, and the effect on labor market behaviors. Of particular interest is whether having a parent in need increases the labor market attachment of men while decreasing the labor force attachment of women. The experimental sample will have over 3,000 couples in which both spouses have living parents, allowing the UCLA team to investigate the transfer of resources to a husband's parents compared to a wife's parents. Preliminary analyses for the provision of parental assistance by married couples suggests that greater financial transfers flow to the husband's parents and greater time transfers to the wife's parents. There are several potential explanations for this pattern—including differences in the opportunity cost of time for the husband and wife, household bargaining models, and preference for providing care to a parent of the same gender as the adult child. Additional modeling work will allow the team to simulate the effects of various policy measures on caregiving and labor market outcomes, including public financial support for caregivers and low-cost long-term care insurance. The work promises to increase our understanding of the economics of marriage and the family and its implications for the older work force.

Columbia University

New York, New York

$467,837 over 35 months to provide working journalists with coherent, accessible current research on working longer as a central strategy toward making population aging into an opportunity rather than an individual and societal crisis.

Project Director: Ruth Finkelstein, Associate Director

The Age Boom Academy at the Columbia Aging Center is a well-respected forum for learning about up-to-date scholarly research regarding the economic, social, and health issues raised by increased longevity. This grant provides three years of support to the Academy to house and develop a platform for improving journalistic understanding of the aging of the U.S. work force. With Sloan support, the Academy will hold a yearly workshop that brings journalists together with leading researchers to discuss the best current scientific thinking about issues related to aging and work. Issues to be addressed include reimagining work and retirement transitions; health expectancy, life expectancy, and work trajectories; and aging and human capital investment. At least 60 journalists are expected to attend the yearly academies, where they will be able to ask questions, develop relationships with scientists in the field, and learn about new and groundbreaking research. The result will be a press corps more empowered to cover issues related to the aging work force.

Columbia University

New York, New York

$450,000 over 24 months to investigate how mental stimulation through different types of activities affects cognitive performance in later life and to determine the unique and overlapping contributions of these activities.

Project Director: Ursula Staudinger, Director

Studies show that cognitive abilities tend to decline postretirement, and that continuation of work or work-like activity can slow cognitive decline. What is less well understood, however, is exactly which activities are most conducive to maintaining cognitive productivity. This grant funds efforts by Ursula Staudinger, director of the Columbia University Center on Aging, to understand whether and to what degree activities that involve novel information processing play a role in arresting cognitive decline.

Combining aspects of three well-respected longitudinal studies, the Health and Retirement Study, the Midlife in America Study, and the Wisconsin Longitudinal Study, Staudinger and her team will catalog the work and leisure activities of respondents and characterize the ways in which these activities involve the processing of new information. Comparing these activities with health data on cognitive decline will then permit an estimation of the role novel processing plays in sustaining mental productivity. The resulting research promises to provide important new evidence that will help us better understand how to optimize cognitive aging and identify the individuals or groups whose activity patterns place them at particular risk for cognitive decline.

Harvard University

Cambridge, Massachusetts

$604,647 over 47 months to deliver an interdisciplinary, postdoctoral training program on aging and work that addresses the challenges of aging societies and labor force participation.

Project Director: Lisa Berkman,
Thomas D. Cabot Professor of Public Policy

This grant supports an initiative by the Harvard Center for Population and Development Studies (HCPDS) to launch an interdisciplinary, postdoctoral training program, the Sloan Fellowships on Aging and Work, which will support leading young scholars who wish to use multidisciplinary approaches to study the social and economic challenges posed by the aging work force. Led by center director Lisa Berkman, the HCPDS fellowship program will support three postdoctoral fellows for two-year terms beginning in September 2016. Fellows will be selected through a competitive application process, with candidates evaluated based on a number of criteria, including the quality of past work, the strength of their proposed research plans, and their potential to integrate questions, approaches, or analysis from two or more disciplines, including epidemiology, economics, psychology, neuroscience, and sociology.

National Bureau of Economic Research, Inc.

CAMBRIDGE, MASSACHUSETTS

$1,262,700 over 54 months to support dissertation-stage research by economics doctoral students working on a range of labor market issues related to an aging population.

Project Director: David Card,
Class of 1950 Professor of Economics

This grant provides continued support for a fellowship program by the National Bureau of Economic Research (NBER), which supports young economics scholars whose research focuses on issues relating to the labor market for aging workers. Fellowships are awarded for a single year, with a review at the end of the first year and a second-year of funding available but conditioned on satisfactory progress in the first.

The annual selection process includes a broadly disseminated call for proposals that is sent to an extensive list of U.S. Ph.D.-granting economics departments, to researchers who are members of the Society of Labor Economists, and to researchers affiliated with the NBER research programs in Aging, Labor Studies, and Public Economics. Applications are then reviewed by a panel of experts on labor economics, aging, and public finance. Fellows are selected based on the panel's evaluation of their potential to make important contributions to understanding the determinants and consequences of labor market activity at older ages.

Funds from this grant will support three cohorts of four doctoral students beginning with the 2016-17 academic year.

New York University

NEW YORK, NEW YORK

$696,815 over 29 months to evaluate how changes in tax and benefit policies and in retirement savings policies would impact wealth accumulation and labor supply of older workers.

Project Director: Andrew Caplin,
Silver Professor of Economics

Funds from this grant support a project by economist Andrew Caplin to understand the interaction between policies that stimulate greater retirement savings and those that encourage working later in life. Using a rich administrative dataset on Danish workers, Caplin will use structural estimation methods and model-driven survey questions to develop a model that will simulate workers' responses to a variety of public policy changes. The model will predict how households, faced with wage, health, and mortality shocks, respond by changing their decision on how much to save, what medical goods and services to purchase, and whether and when to retire or to work full or part time.

Caplin's research, focused as it is on how decisions to save and decisions to work are jointly affected by changes in the circumstances facing households, represents an unusually useful addition to the economics literature on working longer, since little is known about the interaction between savings, consumption, and decisions to enter or exit the work force. Caplin anticipates the work will result in three published papers and a workshop. The survey data he collects and the model he develops will also be made openly available for use by other researchers.

RAND Corporation

SANTA MONICA, CALIFORNIA

$347,872 over 24 months to understand how joint retirement and partial retirement interact.

Project Director: Katherine Carman,
Full Economist/Principal Investigator

Whereas retirement in a traditional marriage of breadwinner and homemaker involves a single retirement decision, in a two-earner marriage the decisions are dual, and in many cases, joint. Yet, exactly what the pathways are for both members of working couples as they transition from full employment to full retirement are less than clear. This grant to the RAND Corporation supports a research project aimed at increasing our understanding of couples' work and retirement trajectories by developing a theoretical model describing joint work-to-retirement transitions that can be applied to 12 waves of the Health and Retirement Study data. The data will allow the RAND team to examine how preferences for joint retirement and opportunities for partial retirement interact in the retirement decision, provide the first estimates of the prevalence of different joint work-to-retirement trajectories, and examine how factors such as age differences, part-time work opportunities, and leisure cause couples to make similar or different retirement transitions. In addition, the RAND team will explore how multistate models can be applied to the analysis of Health and Retirement Study data to explain retirement transitions across a range of pathways from full-time work to full-time retirement, including transitions through part-time employment.

RAND Corporation

Santa Monica, California

$1,532 over 36 months to advance knowledge on how human capital depreciating innovation affects older workers and on the role of training in modifying those effects.

Project Director: Nicole Maestas,
Associate Professor of Health Economics

New technologies in a workplace—new devices, new software systems, new production techniques—often require workers to acquire new skills. Workers who do not learn how to properly use these new technologies become less productive relative to workers who do and, in theory, less valuable to their employer. This grant funds work by Nicole Maestas of the RAND Corporation to examine how technological change affects the employment outcomes of older workers. Using a large dataset on German workers, Maestas and her team will analyze how technological innovations affect wage growth, employment status, and exit from the labor market among older workers; whether older workers are less likely than younger workers to receive training after innovation changes; and whether training can reduce or reverse the potential negative effects of innovation on the employment outcomes of older workers.

Stanford University

Stanford, California

$473,248 over 36 months to study the effects of the Affordable Care Act on Older Workers' Labor Market Outcomes.

Project Director: Mark Duggan,
Wayne & Jodi Cooperman Professor of Economics

The Affordable Care Act (ACA) represents the largest reform to the U.S. health care system since the 1965 introduction of Medicare and Medicaid. Questions arise as to the possible effects of this significant health care change on the labor market behavior of near-elderly workers (workers aged 59 to 64, who are not yet eligible for Medicare). This grant supports a study by Mark Duggan and his colleague Gopi Shah Goda that examines the likely effects of the ACA on labor outcomes for these near elderly. Duggan and Goda will address several questions about the ACA, including how the ACA affects the employment, labor force participation, self-employment, wages, hours of work, and related labor market outcomes of older workers; which provisions of the ACA contribute to the estimated effects; and how these effects vary over time and by gender, race, ethnicity, marital status, educational attainment, and health.

Stanford University

Stanford, California

$302,859 over 24 months to estimate the effect of the Veteran's Administration Disability Compensation (DC) enrollment on older veterans' labor market outcomes.

Project Director: Mark Duggan,
Wayne & Jodi Cooperman Professor of Economics

This grant supports efforts by economists Mark Duggan of Stanford University and Courtney Coile of Wellesley College to increase our understanding of how incentives created by public policy affect labor market behavior of older workers by examining changes to the Veterans Administration Disability Compensation (VA-DC) program. Their work seeks to exploit a "natural experiment" occasioned by a 2001 change in the VA-DC that increased the generosity of the program, particularly for veterans of the Vietnam War. Analyzing administrative data on enrollees both before and after the change in policy, Duggan and Coile will estimate the effect of VA-DC enrollment on older veterans' labor market outcomes; determine how these effects vary with age, race, ethnicity, marital status, educational attainment, and health; explore the effect of VA-DC enrollment on spouses' labor market outcomes; examine the effect on enrollment in other government programs and on enrollees' health status and economic well-being; and investigate whether expansions in the program's eligibility criteria increased the sensitivity of older veterans' labor market outcomes to economic conditions.

The Urban Institute

Washington, District of Columbia

$474,087 over 18 months to assess recent trends in Medicare enrollees' access to physician services at the state and local level and to study the implications for labor supply decisions at older ages.

Project Director: Fredric Blavin,
Senior Research Associate

A number of economic studies have found that workers with access to private retiree health insurance are much more likely to retire than are their counterparts without such access who must rely entirely on Medicare. This grant to the Urban Institute supports a project that looks at the relationship between health insurance and decisions to ex-

tend work lives or to retire. Drawing on data from physician and household surveys, this project will address a number of important issues, including recent trends in physicians' acceptance of Medicare patients, how Medicare beneficiaries' access to care differs from those with private insurance, how these differences correlate with various factors like physician specialty, and whether these differences affect retirement decisions. Findings will shed important new light on the relative attractiveness of Medicare relative to private health insurance and the extent to which that comparison affects the exit of older workers from the labor market.

Grants Against Prior Authorizations

In December 2014, the Trustees authorized the expenditure of up to $450,000 for grants that aim to expend understanding of the demand and supply sides of the older worker labor market. The following grants were made against this previously authorized fund.

American Council on Education
WASHINGTON, DISTRICT OF COLUMBIA
$122,739 over 9 months to support a national conference to identify, catalog, and disseminate generalizable principles, strategies, interventions, and tools that can be modified and used to assist senior faculty as they begin to transition to retirement.
Project Director: Jean M. McLaughlin, Associate Director

The University of Chicago
CHICAGO, ILLINOIS
$125,000 over 24 months to investigate the impact of the Social Security Retirement Earnings Test.
Project Director: Damon Jones, Assistant Professor

Fedcap Rehabilitation Services Inc
NEW YORK, NEW YORK
$124,828 over 18 months to design and pilot a staffing agency focused on placing experienced workers age 55+ in part and full time jobs at market wages and to ensure that the business model for this staffing agency has the potential for achieving solvency within two years.
Project Director: Lorrie Lutz, Chief Strategy Officer

Officer Grants

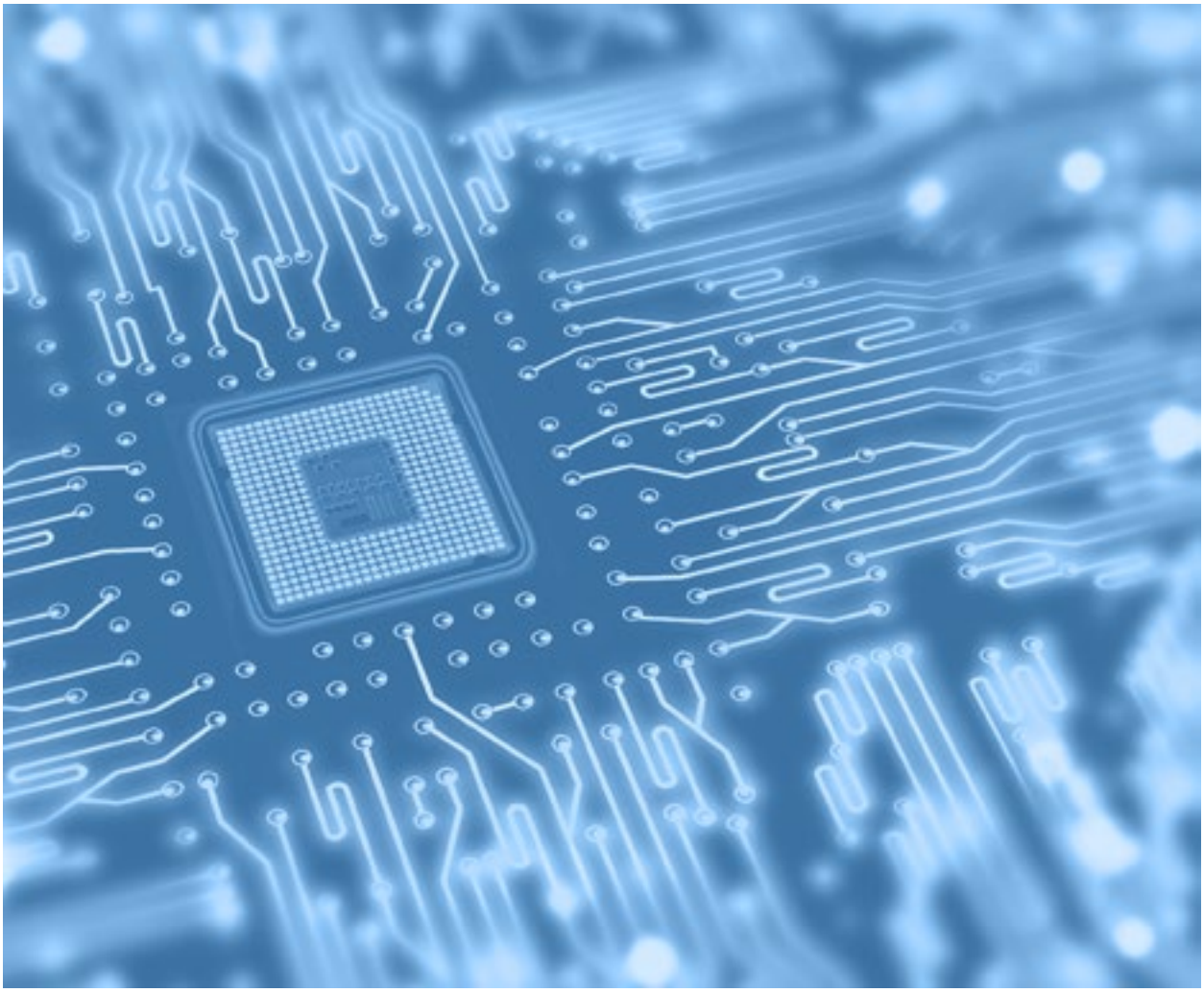
University of California, Irvine
IRVINE, CALIFORNIA
$20,000 over 12 months to extend the just-completed major field experiment on age discrimination from 11 to 50 states, and to provide evidence on the relationships between direct measures of age discrimination in hiring.
Project Director: David Neumark, Chancellor's Professor of Economics

Colorado State University
FORT COLLINS, COLORADO
*$63,773 over 14 months to analyze existing data linked from two sources, the Health and Retirement Study and the Occupational Information Network (O*NET) database, to study two novel research questions regarding workers' perceptions of their work ability (i.e., job-related functional capacity).*
Project Director: Gwenith G. Fisher, Assistant Professor

National Bureau of Economic Research, Inc.
CAMBRIDGE, MASSACHUSETTS
$19,472 over 24 months to support a pre-conference as part of a larger project to better understand the retirement and work prospects of women by connecting events in their early adult lives to their later employment histories.
Project Director: Claudia Goldin, Director & Research Associate

Stanford University
STANFORD, CALIFORNIA
$114,687 over 12 months to explore to what extent health, job demands, and job exposures drive early disability and retirement events for workers in the manufacturing sector.
Project Director: Mark Cullen, Professor

Stanford University
STANFORD, CALIFORNIA
$72,758 over 12 months to gain new insights regarding labor market pathways to retirement with particular attention to the role of self-employment and to analyze the labor market participation of the 1945 birth cohort from ages 54–68 in a comprehensive manner.
Project Director: John B. Shoven, Director, SIEPR



Digital Information Technology

Data and Computational Research

Program Director: Joshua M. Greenberg

The goal of this program is to accelerate scientific discovery by helping researchers fully exploit the opportunities created by recent advances in our ability to collect, transmit, analyze, store, and manipulate data. Grantmaking aims to support the efficient management and sharing of research data and code at every point in the scientific pipeline—from acquisition through analysis to archiving—and to grow the current and future scientific data workforce.

Grants in this program fall into four broad categories:

- **Software grants** support technology development projects ranging from building of prototypes, to iterative redevelopment, to providing resources for scaling;
- **Training grants** support workforce training and curricular initiatives as well as targeted efforts to speed adoption of new technologies by research communities;

Participants at the 4th Annual Data Science Environment Summit in October 2015. The Summit brings together data scientists from each of the three data science environments supported by the Sloan and Moore Foundations to network, discuss the latest scholarship, and develop strategies for effectively integrating data science into the university research ecosystem. (PHOTO COURTESY OF THE UNIVERSITY OF WASHINGTON ESCIENCE INSTITUTE)

- **Research grants** bring historical, ethnographic, and economic research methods to bear on our understanding of how scholars use technology and how technology is changing scholarship;
- **Community grants** build networks for knowledge exchange across research disciplines and help strengthen institutions that incubate sustainable research and software projects while producing the next generation of data scientists.

Trustee Grants

University of California, Berkeley

Berkeley, California

$1,512,547 over 36 months to support continued development of the Jupyter platform for scientific computing and its developer community.

Project Director: Fernando Perez, Associate Researcher

This grant supports the continued development of the Jupyter Notebook, an open source platform for interactive computing that aims to bring the traditional research notebook into the digital age, enabling researchers to capture, log, and version their work from data collection through stages of cleaning, linking, and preparation all the way to analysis and publication. Grant funds will allow the project, led by physicists-turned-data-scientists Fernando Perez and Brian Granger, to hire a project manager and user interface designer, enhance coordination with the growing community of Juypter volunteer developers, and add new features to the platform, including simultaneous multi-user editing, interactive computing capabilities, and better integration with scholarly publishing systems.

University of California, Los Angeles

Los Angeles, California

$1,424,012 over 36 months to study how disciplinary configurations, scale, and methods of collection influence the circulation of scientific research data.

Project Director: Christine Borgman, Professor

This grant supports a project by UCLA Professor of Information Studies Christine Borgman to investigate the role of three key variables that influence the circulation of data in a given scientific community: diversity of disciplines, degree of centralization of data collection, and scale of data (i.e., "big" vs. "long-tail"). Through a set of research sites drawn from astronomy, ocean science, and biomedicine, and leveraging over a decade of data collected and coded from additional research sites, Borgman and her team will chart how these three attributes influence data practices. The resulting work will shed light on how the structure of scientific collaborations affects the willingness to share data, and help identify those areas of the scientific enterprise that may be more or less amenable to widespread data sharing. In addition to academic publications, Borgman's work will produce implementable guidelines that could inform the design of future efforts by private and government funders interested in increasing data sharing in the sciences.

Carnegie Mellon University

Pittsburgh, Pennsylvania

$1,098,493 over 36 months to study and develop best practices for community code engagements in the context of scientific software development.

Project Director: James D. Herbsleb, Professor

Recent work by Jim Herbsleb at Carnegie Mellon University found that volunteer contributions to open source software development projects increased in the aftermath of "community code engagement" (CCE) events like hackathons or summer coding projects. Yet little is known about how exactly CCEs lead to more contributions from volunteers, what makes for a good CCE, and what pitfalls to avoid. This grant funds efforts by Jim Herbsleb to continue his examination of how CCEs spur contributions to scientific software development and to compile a list of best practices for CCE design and implementation. Over the next three years, Herbsleb and his team will study successful and failed CCEs through participant observation, semistructured interviews, and quantitative analysis of software version histories to determine

contribution patterns. He will then develop a set of best practices for CCE design and test these guidelines in a series of pilot projects. Herbsleb and his team will then develop a CCE Toolkit that they will introduce to scientific software developers at a series of workshops attached to disciplinary meetings. The project promises to provide useful new information on how to spur engagement in community software development, an activity that is likely to become increasingly important as science moves further and further into the information age.

Columbia University

New York, New York

$600,007 over 36 months to support the development, maintenance, and dissemination of Stan, a probabilistic programming language that simplifies Bayesian modeling and data analysis.

Project Director: Andrew Gelman, Professor

Bayesian statistical analysis is powerful, yet it is infrequently used in many scientific domains. Calculating Bayesian probability distributions is complicated, and available computer programs designed to do the job are slow and inefficient. As a result, a useful intellectual tool for the scientific analysis of data lies largely untapped. This grant supports development of Stan, a powerful, open source computing platform designed by Columbia University statistician Andrew Gelman that calculates Bayesian probabilities quickly and efficiently. Funds from this grant will support Gelman's efforts to build out the capabilities of Stan, allowing it to seamlessly interact with other computing platforms like R, Python, and Julia that see wide use in the scientific community. Additional funds support development of Stan's technical capabilities, allowing it to efficiently handle certain complex statistical models, and community development and outreach through the organization of conferences and online users groups.

Council on Library and Information Resources

Washington, District of Columbia

$738,756 over 36 months to support data and software curation postdoctoral fellowships, in order to develop emerging leaders in the field and encourage permanent staffing solutions within academic libraries.

Project Director: Charles Henry, President

This grant provides partial funding for eight postdoctoral fellowships in Data Curation for the Sciences and Social Sciences. Though the fellowship program is administered by the Council on Library and Information Resources (CLIR), fellows are appointed at host institutions, where they work on digital initiatives that marshal a university's technical, archival, and library resources in service to the data curation and management needs of the institution's researchers. Of the eight fellowships supported, four will focus on software curation, the growing archival field that seeks to preserve the software programs and platforms developed for and as a result of scientific research. In addition to providing fellowship support, grant funds will expand the fellowship program to include improved education and training on software curation, both among the fellows and at participating host institutions.

Harvard University

Cambridge, Massachusetts

$751,941 over 19 months to facilitate social science research on large-scale datasets by expanding the capabilities of Dataverse repository software.

Project Director: Gary King,
Albert J. Weatherheard III Professor

There are currently no academic social science repositories that can routinely handle terabytes of data. This despite the fact that the rise of the internet and new sensing technologies are creating large new datasets of potential interest to social scientists, like phone usage data or geospatial social media data. This grant supports efforts by Gary King at Harvard University to expand the popular Dataverse platform so that it becomes the first data archiving and management application capable of handling social science data at the terabyte scale. Fully open source, Dataverse is a decentralized web application that allows individual institutions to download and run their own instances. Universities and research labs can manage their data easily while at the same time configuring the system to meet their own needs and comply with their own institutional policies. Funds from this grant will fund the technical development of the Dataverse platform to accommodate the immense logistical and resource challenges posed by "big data" datasets, expanding the power of an increasingly important resource for social scientists everywhere.

The Miami Foundation Inc

Miami, Florida

$640,000 over 24 months to support continued development of the Dat platform for data management as well as targeted outreach to the natural and social science research community.

Project Director: Max Ogden, Computer Programmer

This grant continues support for the development of Dat, a software platform for the versioning and management of tabular datasets. Inspired by Git, the popular system for version control among distributed software developers, Dat supports the tracking of dataset versions not just at the file level, but at the individual cell level, cataloging cell-by-cell changes to the data.

A 2014 grant from the Sloan Foundation has enabled lead developer Max Ogden to move the system from a sketch to a substantial prototype, to ensure that the platform is developed with scientific data in mind, and to launch pilot applications in the sciences using genomic and astronomical data. Funds from this grant will allow Ogden, partnering with Waldo Jaquith of the U.S. Open Data Institute, to move from the current working prototype to a full version 1.0 release. Additional funds support outreach and partnership-building with labs and academic research institutions.

Northern Arizona University

Flagstaff, Arizona

$239,775 over 24 months to develop an interactive text that introduces readers to the core concepts and algorithms of bioinformatics in the context of their implementation and application to real-world problems.

Project Director: J. Gregory Caporaso, Assistant Professor

Funds from this grant will help Greg Caporaso develop an interactive educational text, *An Introduction to Applied Bioinformatics* (IAB), that will introduce readers to the core concepts and algorithms of bioinformatics. Focusing on applications to real-world problems, the project will produce a set of interactive notebooks that will allow students to learn about the complex computational methods used in modern bioinformatics in an engaging, hands-on fashion using live code that can be altered, tweaked, executed, and adapted to their own research or data. The project represents an innovative experiment in how advances in information technology are opening new frontiers for high-quality education on computational methods.

Open Knowledge Foundation

Cambridge, United Kingdom

$690,575 over 24 months to reduce friction in the research process through the development and broad implementation of a lightweight standard for packaging data.

Project Director: Rufus Pollock, President

The basic process of moving large tabular data from one environment to another is fraught with issues. Ambiguous column headings and messy metadata can make it difficult and time consuming to understand exactly what a data file contains. As researchers move data from repository to research tool (and often through a series of research tools), the opportunities for error proliferate.

Rufus Pollock of the Open Knowledge Foundation has developed a lightweight approach to structuring metadata about tabular datasets. With the Pollock approach, tabular datasets are packaged and moved with files that describe the data—datatypes, formatting, source, etc.—allowing research tools like Matlab, Excel, and Stata to appropriately parse the data inside. He describes this "data package" model as the equivalent to a shipping container for data, making it easier to standardize the entire logistics process. Funds from this grant support continued development of Pollock's "data package" standard. Funded activities include the development of validators and extensions that would make it easy to export and import data packages from standard research tools (essentially adding new "Save As" and "Open" options); outreach to specific user communities to model use of the specification; the launch of several pilot projects integrating the data package model into existing user workflows; and building a broader development community around the need for better tools for efficient and trusted storage, transport, and analysis of large tabular data.

Officer Grants

Boston Symphony Orchestra
Boston, Massachusetts
$20,000 over 12 months to add streaming audio capabilities to the HENRY open-source performing arts research portal.
Project Director: Bridget Carr, Senior Archivist

University of Colorado, Boulder
Boulder, Colorado
$124,856 over 15 months to compile case studies of strategies and demand for stewardship of digital research data.
Project Director: Myron Gutmann, Professor & Director

Data & Society Research Institute
New York, New York
$49,975 over 9 months to map how computer scientists navigate issues of privacy, ethics, and equitable access to data; and to explore how research libraries might support better practices.
Project Director: Danah Boyd, President

FPF Education and Innovation Foundation
Washington, District of Columbia
$75,000 over 6 months to partially support a meeting on ethical review processes in corporate human subjects research settings.
Project Director: Jules Polonetsky, President

The Goodly Institute
Oakland, California
$9,000 over 13 months to partially support the development of software.
Project Director: Nicholas Adams, President & Chairman

National Information Standards Organization
Baltimore, Maryland
$48,943 over 24 months to partially support a joint international RDA-NISO working group and public symposium on the privacy implications of research data.
Project Director: Todd A. Carpenter, Executive Director

New York University
New York, New York
$100,000 over 6 months to partially support an international symposium on the future of Artificial Intelligence research and its impact on society.
Project Director: Yann LeCun, Professor

NumFOCUS
Austin, Texas
$20,000 over 1 month to support travel by students and junior faculty to a workshop focused on the development scientific software in the R statistical computing language.
Project Director: Karthik Ram, Assistant Researcher

University of Washington
Seattle, Washington
$36,500 over 12 months to support the incorporation of Optical Character Recognition tools into a citizen science data transcription platform.
Project Director: Kevin R Wood, Research Scientist

University of Washington
Seattle, Washington
$19,975 over 12 months to support a workshop on the repair and maintenance of technological systems from a historical and sociological perspective.
Project Director: Daniela Rosner, Assistant Professor

Scholarly Communication

Program Director: Joshua M. Greenberg

The goal of this program is to empower researchers by supporting the development and adoption of new resources for managing the increasingly diverse array of digital communication channels, enabling scientists to more effectively locate relevant research, network with other researchers, and disseminate their work to the scientific community and the public. Grantmaking aims to improve the discovery and review of diverse scholarly materials and establish new forms of publication connecting data, research software, and analysis—particularly to support the reproducibility of research.

Grants in this program fall into four broad categories:

- **Software grants** support technology development projects ranging from building of prototypes, to iterative redevelopment, to providing resources for scaling;
- **Training grants** support workforce training and curricular initiatives as well as targeted efforts to speed adoption of new technologies by research communities;
- **Research grants** bring historical, ethnographic, and economic research methods to bear on our understanding of how scholars use technology and how technology is changing scholarship;
- **Community grants** build networks for knowledge exchange across research disciplines and help strengthen institutions that incubate new forms of scholarly communication.

Trustee Grants

American Association for the Advancement of Science
Washington, District of Columbia
$772,955 over 30 months to promote the professionalization and institutionalization of the role of the community engagement manager in scientific societies and large-scale research collaborations.
Project Director: Joshua Freeman, Senior Adviser, Multi-media Strategies

Community engagement managers are increasingly seen as vital and irreplaceable elements for the smooth functioning of healthy online communities. Though it is a new field, community engagement has matured quickly, with a growing body of common methods and best practices. Individuals playing this role in scientific contexts, however, are often isolated from this community of practice and left to trial and error to figure out how to be most effective. This grant supports a Community Engagement Fellowship program at the American Association for the Advancement of Science (AAAS) for a network of community engagement managers that will connect several scientific fields. The Fellows will be based in a combination of AAAS-affiliated scholarly societies and large multi-

disciplinary collaborations. Fellows will be brought together for annual training boot camps and monthly professional development webinars, allowing them to share ideas, common challenges, and best practices. Grant funds support approximately half of the planned 18 fellows of the initial cohort, with additional funds provided to offset the costs of outreach, fellow selection, and program administration.

Sonia Barbosa, from Harvard's Institute of Quantitative Social Science, leads a session on next generation data preservation tools at the Dataverse Community Meeting in 2015. Dataverse is a Sloan-supported data management platform that allows scholars to more easily store and share their research data. (PHOTO COURTESY OF HARVARD UNIVERSITY'S DATAVERSE PROJECT)

Association of Research Libraries

WASHINGTON, DISTRICT OF COLUMBIA

$600,000 over 16 months to support the scaling, data quality, and incorporation into university workflows of SHARE, a system for the tracking of research release events across publishers and repositories.

Project Director: Elliott Shore, Executive Director

This grant funds the continued development of SHARE, an open access database and service that links together university-based data repositories in an effort to make scholarly research widely accessible, discoverable, and reusable. Developed in collaboration between the Association of Research Libraries and the Association of Public and Land Grant Universities, SHARE includes not only a searchable database of research, but also a scholarly research notification service that allows users to keep abreast of new developments in scholarship, for example, when a relevant new white paper is uploaded by a scholar they are following, an important dataset is updated, or a previously unpublished study is published. Funds from this grant will support the continued development and expansion of the SHARE platform, including efforts to increase the number of participating data providers, integration of SHARE into the diverse workflows of member institutions, and the cleaning and normalizing of the oft-messy, metadata that powers the SHARE search algorithms.

The University of Chicago

CHICAGO, ILLINOIS

$900,000 over 36 months to accelerate scientific discovery by using statistical machine learning to enable advanced search of mathematical literature.

Project Director: John D. Lafferty, Louis Block Professor

Mathematical formulas are undiscoverable by modern search engines. If you are looking for a famous theorem or an equation with a name, standard search engines like Google or online encyclopedias like Wikipedia can direct you to it. But if what you are looking for is an equation that expresses one variable in terms of another, you are out of luck. Because the consumer base for such information is small and because the task of programming computers to recognize mathematical formulas is difficult, no major search engine has prioritized mathematical search. Yet from a societal point of view, the benefits of accelerating discoveries by providing such search capabilities could surely be enormous.

This grant funds a project by John Lafferty from the University of Chicago and David Blei from Columbia University to advance the field of mathematical search by developing a software program that uses sophisticated pattern recognition and statistical machine learning techniques to recognize and identify mathematical formulas on the web.

George Mason University

FAIRFAX, VIRGINIA

$736,042 over 36 months to support outreach for and adoption of PressForward, a software platform for the editorial curation of online scholarly research products.

Project Director: Sean Takats, Associate Professor

Funds from this grant support the continued development and expansion of PressForward,

a new software platform that aims to speed the dissemination of scholarship by allowing researchers to quickly and easily aggregate online articles, white papers, reports, and blog posts into online digital journals. Built atop the powerful and popular WordPress platform, PressForward enables researchers to impose structure on the diverse variety of scholarly materials proliferating on the web, pulling related materials together that are currently scattered across different preprint servers, personal blogs, and institutional archives.

Over the next three years, grant funds will help the PressForward team, headquartered at the Roy Rosenzweig Center for History and New Media at George Mason University, continue the development of the platform. Planned activities include working with institutional partners to launch 12 new digital projects powered by the platform, outreach to build and strengthen the growing PressForward user base, and development of plans for long-term fiscal sustainability.

Phoenix Bioinformatics

Redwood City, California

$498,945 over 19 months to support the development of a flexible paywall service for scientific data repositories.

Project Director: Eva Huala, Executive Director

The sustainability of scientific data repositories is a matter of much concern. One recent success story is The Arabidopsis Information Resource (TAIR), a plant biology database that shifted from a grant-funded to a community-funded business model through the strategic development of a discriminating paywall that grants free, limited access to many users while requiring a sliding scale paid subscription for full, unlimited access.

TAIR Director Eva Huala believes that a more flexible version of this paywall software could enable many other data repositories to develop their own variations on this model. While there are several for-profit startups offering such services, none offer the functionality needed by scientific data repositories, and these repositories appear to be much too small a market to draw those startups' focus. Funds from this grant will support Phoenix Bioinformatics, the 501(c)3 that runs TAIR, in its efforts to develop a flexible, portable version of its paywall software that could be used by a wide variety of scientific data repositories.

Grants Made Against Prior Authorizations

In June 2014, the Trustees approved the expenditure of up to $500,000 for grants that support implementation of innovative scholarly communication platforms by professional organizations in order to increase uptake by practicing scientists. The following grants were made against this previously authorized fund.

University of Pittsburgh

Pittsburgh, Pennsylvania

$123,728 over 12 months to support the adoption of active curation platforms by Association for Computing Machinery publishing systems.

Project Director: Bruce Childers, Professor

Officer Grants

American Astronomical Society

Washington, District of Columbia

$19,339 over 12 months to support a planning meeting on the integration of software repositories with the publication record.

Project Director: Julie Steffen, Director of Publishing

Brave New Software

Los Angeles, California

$20,000 over 6 months to develop a better understanding of the success and sustainability of selected Sloan-funded free/open source software projects.

Project Director: James Vasile, Grants Director

Columbia University

New York, New York

$20,000 over 9 months to support a meeting on best practices for data publication in the Earth and space sciences.

Project Director: Kerstin Lehnert, Research Scientist

Universal Access to Knowledge

Program Director: Doron Weber

The goal of the Universal Access to Knowledge program is to facilitate the openness and accessibility of all knowledge in the digital age for the widest public benefit under reasonable financial terms and conditions, including the digitization of scientific and cultural knowledge under best practices and standards. Current grantmaking focuses on identifying and crafting solutions to the economic, legal, and institutional barriers to universal access to knowledge and on supporting efforts of the Digital Public Library of America (DPLA), championed by the Foundation since its inception, to become the leading repository for the nation's—and ultimately the world's—scientific and cultural heritage in all its forms. The DPLA serves as a link to thousands of

In April 2015, President Obama announced the Open eBooks initiative, an ongoing partnership of the New York Public Library (NYPL), the Digital Public Library of America (DPLA), and First Book that has enabled more than two million low-income children to access free classic and popular eBook titles. (OFFICIAL WHITE HOUSE PHOTO BY CHUCK KENNEDY)

libraries and cultural institutions across the country, and it contains millions of digitized items. The Foundation supports DPLA's work on the Open eBooks Initiative, launched in 2016 with First Book, the New York Public Library, and the White House to provide low-income students with popular and classic eBooks for free. Since 2008, major support has also gone to Wikipedia, available in 289 languages, now the largest encyclopedia in human history, the fifth largest website in the world, and a model of open, collaborative text production.

Trustee Grants

Digital Public Library of America, Inc.
Cambridge, Massachusetts
$1,901,709 over 30 months support for the Digital Public Library of America to complete its Nationwide Service Hub Network and to pilot an eBooks distribution program.
Project Director: Daniel Cohen, Executive Director

This grant supports the Digital Public Library of America to expand its nationwide service hub network. Service hubs are on-ramps in each state for uploading and sharing digital content from the smallest private collection in a remote rural library to the largest state library or museum. As such, they are the key to DPLA's grass-roots, bottom-up, decentralized approach to building a national digital library. Hubs host locally provided digital content for the DPLA, correct and add metadata to uploaded items, coordinate local events and public outreach, and collaborate with state cultural institutions on digital initiatives. Grant funds will allow the DPLA to add eight new service hubs to its current roster of 15, increasing coverage by 50 percent and moving the institution closer to its goal of being a truly national digital library.

Funds from this grant also support a DPLA initiative to partner with authors, publishers, libraries, and the White House to launch a new service network that provides free eBooks to children.

Officer Grants

Digital Public Library of America, Inc.
Cambridge, Massachusetts
$124,919 over 5 months to help the DPLA launch a new nationwide service bringing together libraries and publishers to provide children with free ebooks.
Project Director: Daniel Cohen, Executive Director

Energy & Environment

Energy & Environment

Program Officer: Evan S. Michelson

This program aims to advance our understanding about the economic, environmental, security, and policy tradeoffs associated with the increased deployment of low-and no-carbon resources and technologies across the energy system.

Formally launched in 2014, this 10-year program will make progress toward achieving this overarching goal by providing support across the following five core outcome areas:

- **Generate Novel Research and Knowledge:** The main focus of this program is to build an impartial scientific and economics knowledge base through the publication of results in peer-reviewed journals, working papers, and widely available reports.
- **Train Next Generation of Scholars and Practitioners:** An important program element is introducing new voices into the field and training the next generation of individuals capable of anticipating and addressing emerging energy challenges and opportunities.
- **Build Multidisciplinary Networks and Communities:** Grantmaking aims to build and strengthen research networks and create longstanding communities of practice that will last beyond the program's duration.
- **Educate Stakeholders and Disseminate Information for Decision-Making**: Through conferences and workshops, high quality grantees will be engaged to apply impartial research findings to inform the development of policies and practices that address the deployment of low- and no-carbon technologies and resources.
- **Attract Additional Resources:** This program aims to seed new ideas that stimulate additional support for research on these topics by government, industry, and philanthropy.

Due to the significant funding available from both public and private sources for energy and environmental research, the Foundation is very selective in the grants it makes in this area. Support is only provided for non-partisan, balanced, evidence-based analysis, and the Foundation does not and will not support energy policy advocacy. Using the energy system as a guiding framework, the Foundation will investigate previ-

ously underexplored and targeted research questions in select areas related to energy sources (supply), energy transmission and distribution, and energy use (demand), along with other cross-cutting topics and systemic opportunities.

Trustee Grants

University of California, Berkeley

Berkeley, California

$1,499,516 over 36 months to support the E2e project and continue the expansion, coordination, and facilitation of interdisciplinary research on energy efficiency through randomized controlled trials and other experimental methodologies.

Project Director: Catherine Wolfram, Professor

This grant provides three years of continued support to the E2e project, a multi-institutional collaboration of researchers who have come together to examine the "energy efficiency paradox," the name given to the puzzling phenomenon of consumers' failure to widely adopt money-saving energy efficiency practices, products, and technologies. Headquartered at the University of California, Berkeley and with organizational nodes at the Massachusetts Institute of Technology and the University of Chicago, the E2e collaboration brings scholars and students together to share and access data, connect with policymakers and the private sector, and work together on the design and implementation of individual and joint research projects. Topics being investigated by E2e researchers include understanding consumer decision-making in the residential sector; how framing, discounting, and choice architecture contribute to informational and behavioral inefficiencies; how to use insights from behavioral psychology and economics to increase the impact of policy interventions; and how well engineering models predict actual real world efficiency gains of adopted technologies. Grant funds provide operating support for the project, including funds for the expansion of the research network to include new scholars, publication of a working paper and policy brief series, data acquisition, a seed funding competition for junior scholars, the development of an online tool to help researchers craft effective experimental designs, and a series of training workshops for students and practitioners.

University of California, Davis

Davis, California

$250,000 over 18 months to study the technological, economic, and environmental trade-offs associated with the use of natural gas as a low-carbon transportation fuel option in the United States.

Project Director: Amy Myers Jaffe, Executive Director

This grant supports a multidisciplinary research effort led by the Institute for Transportation Studies at the University of California, Davis (ITS-Davis) to examine natural gas as an alternative fuel option to power trucks, other long-haul vehicles, municipal bus and taxi fleets, and light-duty passenger vehicles. Bringing together leading economists, engineers, geographers, policy experts, and computer scientists, ITS-Davis will organize a workshop on the issue and commission a series of papers providing a comprehensive overview of the tradeoffs associated with the use of natural gas as an alternative fuel in the transportation sector. Data from the workshop will then be used to enrich ITS-Davis's model of the infrastructure and refueling network that must sustain any transition to natural gas as an alternative fuel. Working closely with researchers at Arizona State University, ITS-Davis also plans to expand its model to accommodate changes in diesel and natural gas fuel prices, alternative technology costs, various rates of new vehicle diffusion, altered traffic flow patterns, and changes to state-level policies.

Columbia University

New York, New York

$248,400 over 23 months to support the Women in Energy program at the Center on Global Energy Policy to help increase gender diversity and female leadership in the energy sector.

Project Director: Jason Bordoff, Founding Director

Funds from this grant provide two years of support to the Women in Energy project at Columbia University's Center on Global Energy Policy (CGEP) as it undertakes a series of educational, networking, mentorship, and career-development activities aimed at supporting and encouraging the involvement of female students in careers related to energy. Funded activities include organizing lectures and small group conversations with leading women in the energy sector, arranging visits for female students to key energy sites in the region, developing a formal mentoring program that connects students with female energy executives, and offering a hand-

ful of small stipends to female students to defray the cost of summer internship opportunities.

Duke University

Durham, North Carolina

$300,000 over 24 months to support Duke University's Energy Data Analytics Lab to develop and apply advanced data analytics tools that improve understanding about potential energy utilization and responses to various interventions that affect energy utilization.

Project Director: Richard Newell, Professor

New technologies like real-time electricity meters and smart appliances are generating vast amounts of new, granular data on household energy consumption. This grant supports the Energy Data Analytics Lab (EDAL) at Duke University in its efforts to use this growing body of data to increase our understanding of household energy consumption patterns; evaluate policy interventions designed to curb energy use; and anticipate strains, failures, and bottlenecks in the electricity sector. Planned research topics over the next two years include investigations into how big data can be used to develop accurate baseline assessments of energy resources, how to use remote sensors to estimate the distribution and growth of household solar panels, and how the discovery and extraction of U.S. natural gas deposits are related to price volatility in the natural gas market. Additional grant funds support a host of outreach and community-building activities by the EDAL, including the hosting of a workshop on advanced energy data analytics, the construction of a web portal to make EDAL research, data, and methods easily available to other researchers, and the training of undergraduate and graduate students through lectures, classroom modules, and laboratory assignments.

Environmental Defense Fund Incorporated

New York, New York

$600,000 over 18 months to undertake a scientific research collaboration studying the environmental impacts of shale oil and gas development, focusing on methane losses from natural gas end users.

Project Director: Steven Hamburg, Chief Scientist

New drilling technologies and the discovery of significant new natural gas reserves in the U.S. are changing the landscape of energy production. As methane becomes plentiful and cheap, it is likely to account for an increased share of energy production both in the U.S. and worldwide. Understanding the environmental implications of this shift is an important step for evaluating current and future regulatory regimes and potential policy responses to the "shale revolution." This grant supports a series of independent research projects coordinated by the Environmental Defense Fund (EDF) that jointly aim to increase our understanding of the source and quantity of gas leaks by residential, commercial, and industrial end users of methane. Led by Chief Scientist Steven Hamburg, EDF will bring environmental researchers from Harvard,

NREL engineer Tony Markel adjusts a bank of dimmer lights and turns on various smart appliances to measure the affect they have for a vehicle grid integration project. The study connects EV cars and smart appliances together, studying the dynamics of how they interact when connected to a grid in the Systems Performance Laboratory at the Energy Systems Integration Facility at the National Renewable Energy Laboratory. (PHOTO BY DENNIS SCHROEDER / NREL)

Purdue, West Virginia University, and the University of Illinois together with engineers from the sensor industry and experts from the U.S. Geological Survey to launch a series of studies designed to measure how much methane gas escapes during its final stop in the distribution pipeline. Since methane is a more potent greenhouse gas than carbon dioxide, understanding the quantities emitted during end use is a crucial element in evaluating the potential climate impacts of a shift to increased reliance on gas. The work also has the potential to identify especially problematic, high-leak varieties of end use as topics worthy of further scientific attention. Grant funds provide research support, offset administrative costs of the project, and support efforts at synthesis and dissemination.

National Bureau of Economic Research, Inc.

Cambridge, Massachusetts

$724,500 over 60 months to support predoctoral research and training fellowships in energy economics.

Project Director: Meredith Fowlie, Assistant Professor

This grant funds the National Bureau of Economic Research (NBER) for the implementation of a predoctoral dissertation research fellowship program in energy economics. Fellowship support will provide young scholars currently enrolled in a Ph.D. program in economics the opportunity to deepen their study of issues related to the economics of energy, including energy market design, innovation and productivity in the energy sector, the economics of the fracking boom, electricity transmission and distribution, infrastructure investment, the effects of environmental and other regulation on energy supply and demand, energy efficiency, and the economics of renewable energy. Fellowships will be for a one-year period with an optional second year of funding contingent on satisfactory progress. Approximately seven fellows are expected to be supported over the grant period. Grant funds will be utilized for student stipends, defraying tuition costs, and permitting travel to professional workshops and conferences.

National Bureau of Economic Research, Inc.

Cambridge, Massachusetts

$588,800 over 36 months to undertake economic research on energy infrastructure, with a focus on hydrocarbon transport and local energy distribution.

Project Director: James Bushnell, Associate Professor

Funds from this grant support an initiative by the National Bureau of Economic Research (NBER) to create a research working group on energy infrastructure. Bringing together leading economists as well as junior scholars entering the field, the working group aims to develop and implement a research agenda focused on two issue areas: the transport of hydrocarbons and the increase in distributed energy generation and storage. Spurred by the discovery of new oil and gas resources in the U.S., research in the first issue area will explore the economic costs, benefits, and policy issues associated with moving oil and methane by truck, rail, and pipeline. Research in the second issue area will focus on issues such as the expanding market for rooftop solar panels, utilization of electric vehicles as backup battery power, developments in smart grid technologies, and how these new technologies interact with existing energy generation and distribution infrastructure. Grant funds will support an initial workshop on each of the two topic areas, the development and implementation of up to 16 separate studies, and a capstone conference for the presentation of research results. The effort will be led by James Bushnell from the University of California, Davis; Ryan Kellogg from the University of Michigan; and Erin Mansur from Dartmouth College.

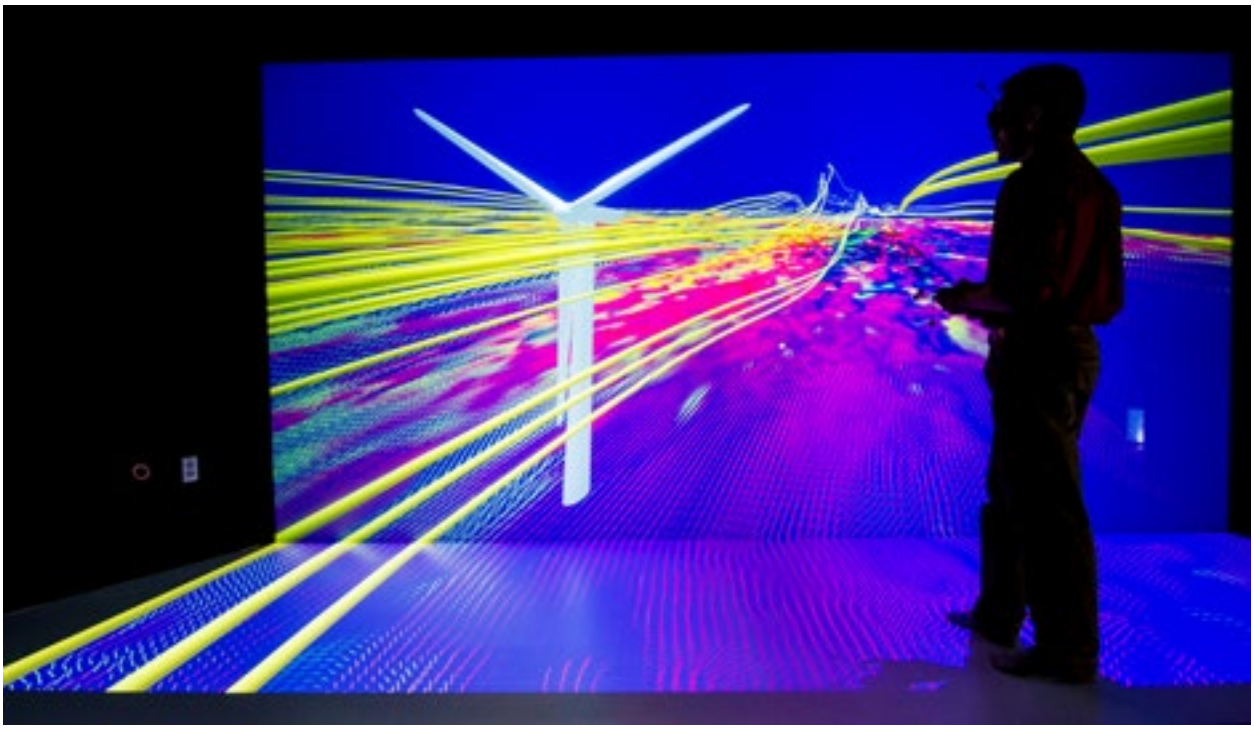
Resources for the Future, Inc.

Washington, District of Columbia

$608,905 over 18 months to understand the benefits and costs of shale gas and oil development on local communities.

Project Director: Alan J. Krupnick, Co-Director, CECE; Senior Fellow

Funds from this grant support three projects by Resources for the Future (RFF) that aim to improve our understanding of the broad array of local community impacts, both positive and negative, brought on by the extraction of shale gas and oil. In its first project, RFF will develop a comprehensive risk/benefit matrix and community impact framework that will bring together, in one place, a description and assessment of the various impacts that communities may face due to local shale gas extraction, covering everything from increased demands on local water infrastructure to increased traffic and noise. The second project will explore the legal and economic dimensions of private land leasing agreements, exploring the diversity of these agreements and how their differences result in differing consequences for municipalities and their residents.



Senior Scientist Kenny Gruchalla, examines the velocity field from a wind turbine simulation using a 3D model at the Insight Collaboration Laboratory during a tour of the Energy Systems Integration Facility (ESIF) at the National Renewable Energy Laboratory (NREL) in Golden, Colorado. (PHOTO BY DENNIS SCHROEDER / NREL)

The third project consists of a qualitative exploration of the development of industry-community voluntary practices, protocols, and behaviors that constitute what is often termed the "social license to operate" in different localities. The effort will catalog how individual communities have worked with oil and gas companies to manage the inevitable disruptions caused by local oil and gas extraction. Taken together, the three projects will create a framework that will capture the diversity of local responses to the influx of shale gas developers, provide useful new directions for future scholarship, and give municipalities new resources for how to manage their own local shale gas and oil development.

Resources for the Future, Inc.

Washington, District of Columbia

$464,800 over 36 months to train the next generation of researchers and practitioners in energy and environmental economics and policy by launching a postdoctoral researcher program.

Project Director: Molly Macauley,
Vice President of Research & Senior Fellow

Funds from this grant support postdoctoral researchers studying energy, natural resource, and environmental economics at the Washington D.C.–based nonpartisan think tank Resources for the Future (RFF). The RFF program has several important strengths. First, supported postdoctoral researchers will split their time between defined projects and independent research, allowing them the opportunity to build the strong list of publications that is vital to securing a longer-term university position. Second, postdoctoral researchers will have the opportunity to build and expand their professional networks in policy, academic, and private sector circles, providing them with a broader range of subsequent career opportunities. Third, researchers will be trained in valuable skills like grant writing, public speaking, presenting material to policy audiences, and event organization, all of which will be critical for their advancement in their careers. Fourth, RFF will draw on a deep roster of senior in-house scholars and its extended network of affiliated university faculty to provide job placement services and career guidance. Fifth, there are no other federally or philanthropically funded energy and environmental economics postdoctoral researcher positions of this kind, making the RFF program unique in the field. Grant funds will provide fellowship and administrative support to the program for a period of three years.

University of Texas, Austin

AUSTIN, TEXAS

$530,060 over 24 months to examine the hydrological characteristics of five major shale gas and shale oil regions, including understanding environmental impacts on regional water resources and induced seismicity effects from wastewater disposal.

Project Director: Bridget Scanlon, Researcher

This grant provides partial support to a research project by the Bureau of Economic Geology (BEG) at the University of Texas, Austin. A multidisciplinary team of hydrologists, geologists, economists, and engineers led by geologist Bridget Scanlon will analyze the hydrological characteristics and wastewater production of five major shale oil and gas plays across the country. Using data on previous drilling at each play, the team will construct historical wastewater production estimates and then use these baseline analyses to forecast future water use and wastewater volumes. The team will then compare how water needs associated with shale drilling compare to other water demands in different regions and then estimate the potential impact of hydraulic fracturing on contributing to water scarcity in these areas. Additional work will focus on gaining a better scientific understanding of increased seismicity induced by the injection of wastewater into disposal wells.

Grants Made Against Prior Authorizations

In March 2015, the Trustees authorized the expenditure of up to $300,000 for small grants in support of workshops and conferences that advance the development of energy and environmental research, focus on trade-offs, and involve advanced students and early-career scholars. The following grants were made against this previously authorized fund.

International Energy Program Evaluation Conference

CHATHAM, MASSACHUSETTS

$20,000 over 8 months to continue in accelerating and advancing the profession of energy evaluation by enabling graduate students to attend the 2016 IEPPEC Conference at no charge.

Project Director: Charles Michaelis, President

International Energy Program Evaluation Conference

CHATHAM, MASSACHUSETTS

$20,000 over 5 months to continue to accelerate and advance the profession of energy evaluation through instilling an interest in and connections to professional evaluation of energy programs and policies by enabling graduate students to attend the IEPPEC Conference at no charge.

Project Director: Jane Peters, President

Massachusetts Institute of Technology

CAMBRIDGE, MASSACHUSETTS

$45,000 over 12 months to organize a workshop that brings together the leadership and management of university energy economics, technology, and policy research initiatives to plan strategically, discuss best practices, and explore possibilities for improved coordination.

Project Director: Christopher Knittel, Professor of Energy Economics

Santa Fe Institute

SANTA FE, NEW MEXICO

$15,000 over 7 months to organize a workshop addressing the technological, social, and industrial dynamics for innovation and transition in electric power production and delivery.

Project Director: Cristopher Moore, Professor

University of South Florida

TAMPA, FLORIDA

$75,000 over 11 months to organize a workshop and develop a research agenda that contributes to a better understanding factors and data related to vehicle miles traveled (VMT).

Project Director: Steven Polzin, Director, Mobility Policy Research

Stanford University

STANFORD, CALIFORNIA

$10,000 over 7 months to support the Precourt Energy Efficiency Center to provide stipends to advanced undergraduates, graduate students, and post-doctoral researchers to attend the 2015 Behavior, Energy and Climate Change (BECC) Conference in Sacramento, CA.

Project Director: James L. Sweeney, Director

Discussants at the Open Panel discussion at the 11th U.S.–China Electric Vehicle and Battery Technology Information Exchange held in Denver, CO. (PHOTO BY DENNIS SCHROEDER / NREL)

Officer Grants

University of California, Berkeley
BERKELEY, CALIFORNIA

$124,989 over 25 months to train highly qualified Ph.D. graduate students from across North America in energy and environmental economics topics and techniques through an advanced summer training program.

Project Director: Maximilian Auffhammer,
George Pardee Professor of Sustainable Development

Carnegie Endowment for International Peace
WASHINGTON, DISTRICT OF COLUMBIA

$75,000 over 10 months to provide consistent, open-source baseline data on the different environmental characteristics of oils in production and enhance information dissemination through improved visualizations.

Project Director: Deborah Gordon, Director

Columbia University
NEW YORK, NEW YORK

$50,000 over 12 months to continue support for the Center on Global Energy Policy's external speaker series to inform public debate about critical energy issues.

Project Director: Jason Bordoff, Founding Director

Harvard University
CAMBRIDGE, MASSACHUSETTS

$110,130 over 24 months to examine the efficiency, cost effectiveness, and fiscal impacts of implementing multiple, overlapping renewable energy policy instruments.

Project Director: Joseph Aldy,
Assistant Professor of Public Policy

Massachusetts Institute of Technology
CAMBRIDGE, MASSACHUSETTS

$75,000 over 12 months to assess the past and present capabilities of the U.S. nuclear energy innovation system.

Project Director: Richard K. Lester, Department Head

University of Michigan
ANN ARBOR, MICHIGAN

$72,846 over 13 months to undertake qualitative and survey research that explore the factors related to transportation and travel preferences among younger millennial generations.

Project Director: Thomas Lyon, Professor

National Academy of Sciences
WASHINGTON, DISTRICT OF COLUMBIA

$20,000 over 18 months to provide partial support for the formation of a multi-sectoral Roundtable on Unconventional Hydrocarbon Development to gather and critically examine the scientific, engineering, regulatory, and environmental dimensions of unconventional hydrocarbon development.

Project Director: Elizabeth Eide,
Director, Board on Earth Sciences & Resources

Stanford University
STANFORD, CALIFORNIA

$50,000 over 4 months to organize a one-day conference at the Program on Energy and Sustainable Development exploring the economic, technological, and regulatory barriers to deploying a suite of emerging low carbon energy technologies and resources at scale.

Project Director: Frank Wolak, Professor

Syracuse University
SYRACUSE, NEW YORK

$48,900 over 12 months to provide partial support for a study examining how consumers perceive privacy risks associated with smart grid and home energy technologies.

Project Director: Jason Dedrick,
Associate Professor, Associate Dean for Research

Initiatives

New York City Initiatives

Program Director: Paula J. Olsiewski

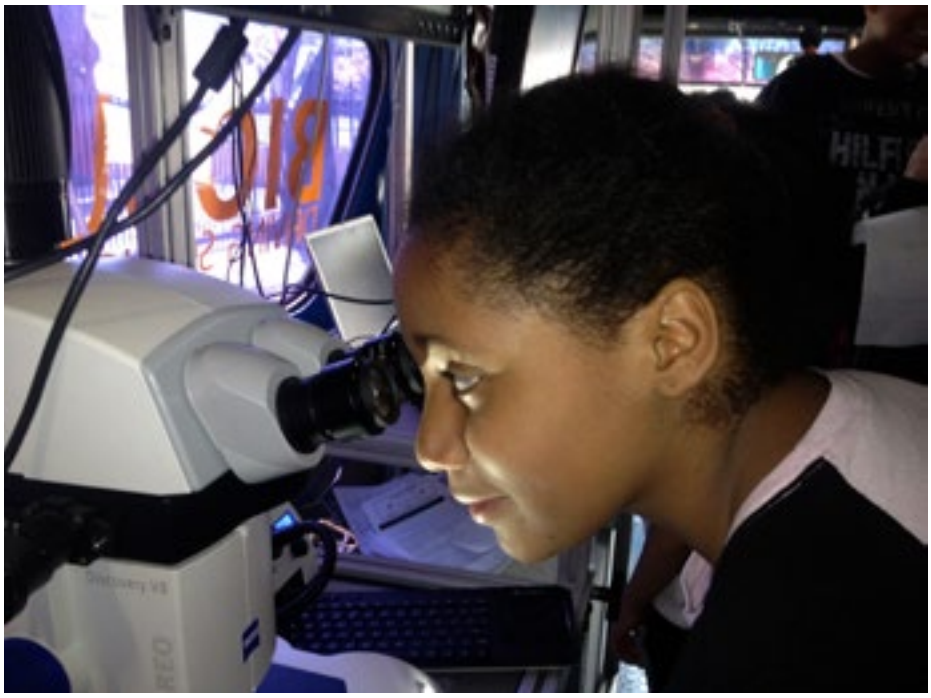
Since its founding in 1934, the Alfred P. Sloan Foundation has been proud to call New York City home. With its New York City Initiatives program, the Foundation responds to unique opportunities to benefit the New York City metro area with an eye toward advancing the Foundation's other interests in research and education in science, technology, and economics.

Major projects supported through this program include:

- **Sloan Public Service Awards:** Annual awards that honor the lifetime contributions of six NYC civil servants.
- **Sloan Awards for Excellence in Teaching Science and Mathematics:** Annual awards that recognize extraordinary science and math teachers in NYC public schools.
- **InsideSchools.org:** Not-for-profit website that provides independent information on each of NYC's 1,800 public schools.
- **The DNA Learning Lab:** A new, Manhattan branch of Cold Spring Harbor Laboratory's DNA Learning Center, which brings innovative, high-quality, genomics education to NYC students.
- **New York Genome Center:** A new, state-of-the-art genomic research and sequencing facility in Manhattan that provides services to a consortium of a dozen prominent NYC research organizations.
- **BioBus:** Educational organization that uses a bus retrofitted into a mobile biology lab to bring fun, hands-on biology education to New York City students.

In recent years, grantmaking in this program has focused on revitalizing the NYC science, technology, and engineering sector.

Though the New York City Initiatives program is the only Sloan grant program specifically designed to benefit New York, it is not the only way the Foundation contributes to the state. Many of the grants in our other programs go to New York institutions. Approximately one out of every four Foundation grant dollars goes to an institution based in New York.



A student looks though a microscope inside the BioBus. Supported by the Sloan Foundation, the BioBus is a laboratory on wheels that brings fun, engaging biology education to students in New York City. (PHOTO COURTESY OF FLICKR USER BIOBUS DRIVING SCIENCE EDUCATION)

Trustee Grants

Business-Higher Education Forum

Washington, District of Columbia

$650,000 over 48 months to support the New York City (NYC) Data Science Task Force as it leads the planning, design, and implementation of new partnerships, pathways, and learning opportunities in data science and analytics at the undergraduate level.

Project Director: Isabel Cardenas-Navia, Director, Emerging Workforce

Funds from this grant support an initiative by the Business-Higher Education Forum (BHEF) to expand the number of NYC metro area institutions involved in educating undergraduates to become data scientists and data science–enabled professionals. Over the next four years, BHEF will convene and support the NYC Data Science Task Force of approximately 40 representatives from academic institutions, corporations, cultural and research organizations, and government agencies; convene two working groups, one aimed at mapping the skills, competencies, and knowledge needed for data scientists and one on developing a repository of undergraduate data science curricular resources; partner with NYC institutions to create data-science-focused courses, concentrations, and minors; work with industry partners to create high-quality internships and other student work experiences in data science and create guidelines and best practices for the creation of these experiences; and disseminate lessons learned to the broader educational community.

Cell Motion Laboratories, Inc.

New York, New York

$800,000 over 34 months to support expansion of the BioBus and BioBase STEM education programs in Harlem.

Project Director: Benjamin J. Dubin-Thaler, Executive Director

The BioBus is a fully mobile research lab that visits schools and public science events in New York City. Outfitted with state-of-the-art microscopes and run by a diverse team of young scientists, the BioBus is a mobile science field trip where students can use a phase-contrast video microscope to make movies of crawling amoeba, use a scanning electron microscope to image a fly eye, or use a fluorescing microscope to see glowing, streaming plant chloroplast. In 2014, the BioBus visited 88 K-12 schools in New York City, bringing high-quality, engaging education to some 16,000 students, 57 percent of whom were African-American or Latino. Funds from this grant support the continued operation and expansion of BioBus. Over the next three years, Cell Motion Laboratories, the parent organization of the BioBus, will build another BioBus mobile

lab and, in partnership with Columbia University, build a "BioBase" community lab in Harlem, which will allow students to continue their educational experiences once the BioBus has moved locations, and expand its educational offerings to underserved students in Harlem.

Council for Economic Education

New York, New York

$163,980 over 24 months to promote economics education in New York area schools by recognizing innovative teachers and promoting their methods.

Project Director: Christopher Caltabiano, Vice President of Programs Administration

This grant provides two years of continued support for the administration of the Sloan Teaching Champion Awards, an annual awards program run by the Council for Economic Education that recognizes outstanding financial and economics education by secondary school teachers in the New York City metropolitan area. Winners are selected by an independent committee based on a number of diverse factors, including their effectiveness, creativity, and success in motivating underserved students. Winners receive a $5,000 cash prize $2,500 to be used to augment economic education programs at their respective schools. Winning teachers are honored at a high-profile event in New York City.

Fund for Public Health in New York, Inc.

New York, New York

$1,044,516 over 36 months to evaluate and validate the use of social media for foodborne outbreak detection.

Project Director: Sharon Balter, Director

The New York City Department of Health and Mental Hygiene (DOHMH) estimates that more than 1,000 restaurant-associated outbreaks of foodborne illness occur in the city each year. Outbreaks are usually reported by the victims themselves via telephone calls to 311 or the health department. Most victims don't bother, however, and as a result the DOHMH detects only about 30 outbreaks each year. Since quickly detecting foodborne illness outbreaks is critical to implementing control measures in time to protect the public, better detection measures are needed. This grant funds a project by the Fund for the City of New York, in collaboration with the DOHMH and researchers at Columbia University to experiment with using Twitter and other social media to detect unreported instances of restaurant-related foodborne illness. The theory is that while people may be unlikely to report a foodborne illness to the health department, they are much more likely to tweet or post to Facebook about it. Real-time analysis of public data from Twitter and other social media sites may be able to reliably inform health department officials of outbreaks as they are happening. Over the next three years, the FCNY team will develop algorithmic methods for searching Twitter feeds, identifying tweets potentially relevant to foodborne illness outbreaks in NYC, and then evaluate the reliability of those algorithms in detecting actual outbreaks. Additional grant funds support efforts to increase voluntary reports of foodborne illness outbreaks by allowing NYC residents to report illness directly through Twitter. The project is experimental, but the prospective gains are large. Even a small increase in the ability to detect restaurant-related foodborne illness outbreaks would represent a significant improvement of current detection capabilities.

Fund for the City of New York

New York, New York

$780,000 over 32 months to provide partial support for the Sloan Public Service Awards program.

Project Director: Mary McCormick, President

Each year since 1973, the Sloan Public Service Awards have recognized six outstanding civil servants out of the hundreds of thousands of people who work for New York City government. The Fund for the City of New York manages the nomination and selection process and refers to the awards as "the Nobel Prizes of Government..., the highest award that can be bestowed upon a New York City public servant." Nominated by their colleagues and selected by a blue-ribbon panel of distinguished New Yorkers, each of the six winners receives a $10,000 cash prize and is honored at individual celebrations at their workplaces and at a city-wide celebration. This grant provides three years of continued support for the Sloan Public Service Awards.

The New School for Social Research

New York, New York

$960,000 over 36 months to provide New York City parents, particularly those in underserved communities, with information and data needed to make sound choices about their children's education,

especially in science, mathematics, economics, and computer science.
Project Director: Clara Hemphill, Founder & Senior Editor, Insideschools

This grant supports the continued operation and administration of InsideSchools.org, a public website that provides comprehensive information on New York City's 1,800 public schools, including photos and videos of the school, student achievement statistics, course offerings, and reviews compiled by independent reviewers from on-site visits. Grant funds provide three years of core operational support as well as planned efforts to improve the site's search capabilities and accessibility via smartphones and other mobile devices. In addition, the grant provides resources to help the site develop and implement plans for long-term financial sustainability.

New York Genome Center, Inc.
New York, New York
$3,000,000 over 36 months to strengthen the bioinformatics community in New York City.
Project Director: Michael Zody, Research Director

Funds from this grant provide continued operating support to the New York Genome Center (NYGC) in its efforts to strengthen and diversify the bioinformatics community in New York City. Sloan funds will support the NYGC's plans to develop new infrastructure, methods, and training that it expects will catalyze research insights, empower researchers with new bioinformatics capabilities, and continue to solidify New York City as a genomics and life sciences hub.

Over the next three years, the NYGC will continue to develop its bioinformatics capabilities in support of its member institutions, develop a shared computing facility with access to public data sets and state-of-the-art data analysis pipelines, craft new algorithms and techniques in bioinformatics, and train biological and medical researchers in core bioinformatics skills through training courses and in-person and virtual educational sessions. Expected outputs include peer-reviewed publications, updated software packages, a bioinformatics commons and genomic data warehouse, and the training of 50 researchers per year.

Grants Against Prior Authorizations

In October 2015, the Trustees approved the expenditure of up to $300,000 for grants that support the planning of data user facility at the NYU Center for Urban Science and Progress (CUSP). The following grant was made against this previously authorized fund.

New York University
New York, New York
$300,000 over 6 months to conduct planning activities to develop the CUSP Data User Facility.
Project Director: Julia Lane, Professor

Officer Grants

Columbia University
New York, New York
$64,951 over 6 months to develop strategies to improve emergency preparedness at NYC schools.
Project Director: Jeff Schlegelmilch, Managing Director

The Graduate Center Foundation, Inc.
New York, New York
$27,000 over 12 months to develop a plan for a next-generation CUNY Institutional Repository.
Project Director: Matthew K. Gold, Associate Professor & Director

The Graduate Center of The City University of New York
New York, New York
$15,000 over 12 months to support the development of the City University of New York Digital History Archive.
Project Director: Andrea Vasquez, ASHP Associate Director

New York University
New York, New York
$22,611 over 3 months to provide partial support for the Computer Science for Cyber Security summer program for High School women.
Project Director: Nasir Memon, Department Head

International Science Engagement

Program Director: Doron Weber

The International Science Engagement initiative seeks to bring scientists and engineers in conflict regions together to collaborate on shared research challenges and to solve common problems in order to develop professional networks and enhance the regions' science-based quality of life while meeting face-to-face, reducing tensions, and improving mutual understanding and cooperation.

The initiative is primarily focused on efforts to create a South Asia Science Center based in Singapore that would include researchers from India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Malaysia, Philippines, Vietnam, Taiwan, and China. After an exploratory 2012 meeting on rice science at Lee Kuan Yew School of Public Policy, the initiative is now working with Nanyang Technological University, which held a pilot meeting on earthquake science in 2015 involving 11 Asian nations.

The Foundation convened a two-day conference on Earthquake Science at Nanyang Technological University's Earth Observatory of Singapore in November 2015. The conference featured presentations by scientists from 11 Asian nations, including Bangladesh, China, India, Indonesia, Myanmar, Nepal, Pakistan, the Philippines, Taiwan, Thailand, and Vietnam.

Related grants in this area support a select number of opportunistic projects that draw on science as a transnational, non-ideological community of shared interests and values. Examples include Foundation support for the Scholar Rescue Fund, which provides life-saving fellowships and academic placements for persecuted scholars from around the world.

Grants Made Against Prior Authorizations

In October 2010, the Trustees authorized the expenditure of up to $500,000 for a series of pilot grants to support established science diplomacy organizations and to enlist their efforts on behalf of Sloan's new initiative in International Science Engagement. The following grants were made against this previously authorized fund.

Friends of NTU
San Jose, California
$125,000 over 14 months as a planning grant to support the creation of a regional center of science and technology for South Asia.
Project Director: Subodh Mhaisalkar, Executive Director

Other Initiatives

The Foundation occasionally makes small, out-of-program grants in support of the philanthropic community, science philanthropy, or to take advantage of unique philanthropic opportunities. In recent years, grants have focused on support for the Science Philanthropy Alliance, an organization devoted to increasing charitable contributions to basic scientific research, and to a host of institutions that provide support services to philanthropy and philanthropists.

Grants Against Prior Authorizations

In June 2015, the Trustees authorized the expenditure of up to $185,000 for grants that support work conducted on behalf of the nonprofit and charitable community. The following grants were made against this previously authorized fund.

Council on Foundations, Inc.
Arlington, Virginia
$45,000 over 12 months to support work on behalf of the nonprofit and charitable community.
Project Director: Vikki N. Spruill, President and CEO

Foundation Center
New York, New York
$75,000 over 12 months to support work on behalf of the nonprofit and charitable community.
Project Director: Bradford K. Smith, President

GuideStar USA, Inc.
Williamsburg, Virginia
$10,000 over 12 months to support work on behalf of the nonprofit and charitable community.
Project Director: Beth Suarez, Director of Development

Philanthropy New York
New York, New York
$28,000 over 13 months to support work on behalf of the nonprofit and charitable community.
Project Director: Ronna D. Brown, President

Technology Affinity Group
Wayne, Pennsylvania
$5,000 over 9 months for 2015 Membership Dues.
Project Director: Lisa Dill Pool, Executive Director

In October 2013, the Trustees authorized the expenditure of up to $550,000 to encourage charitable giving in support of basic scientific research through the Sloan Foundation's membership in the Science Philanthropy Alliance. The following grants were made against this previously authorized fund.

New Venture Fund
Washington, District of Columbia
$180,000 over 12 months to encourage charitable giving in support of basic scientific research through Sloan membership in the Science Philanthropy Alliance.
Project Director: Bruce Boyd, Managing Director & Principal

Officer Grants

Natural Heritage Trust
Albany, New York
$25,000 over 12 months to connect children and families to New York's state parks.
Project Director: Allen G. Payne, Executive Director

New America Foundation
Washington, District of Columbia
$20,000 over 4 months to provide partial support for a workshop on encryption and privacy.
Project Director: Ian Wallace, Co-Director, Cybersecurity Initiative

New York University
New York, New York
$40,250 over 4 months to support a workshop and initiate a process for discussion of key cybersecurity issues amongst thought leaders in government, industry, academia, and other sectors.
Project Director: Nasir Memon, Department Head

Rockefeller Philanthropy Advisors
New York, New York
$30,000 over 17 months to participate with a consortium of fellow funders in developing a Theory of Foundation initiative.
Project Director: Melissa Berman, President & CEO

2015 Financial Review

The financial statements and schedules of the Foundation for 2015 and 2014 have been audited by Grant Thornton LLP. They include the balance sheets, statements of activities and cash flows, and schedules of management and investment expenses.

Investment income for 2015 was $8,148,951, a decrease of $5,382,580 from $13,531,531 in 2014. After the deduction of investment expenses and provision for taxes, net investment income was ($2,655,184) in 2015 as compared to $198,583 for the prior year. Investment expenses for 2015 consisted of $4,800,221 of direct investment expenses and $2,773,914 for investment management fees. Total investment expenses and provision for taxes of $3,230,000 equaled $10,804,135 versus $13,332,948 in 2014. Total investment gains for 2015 were ($9,374,906) as compared with $81,585,038 in 2014.

Grants authorized (net of grant refunds) and management expenses during 2015 totaled $91,175,108 as compared to $83,912,727 for the prior year. Of this total, grants authorized (net of refunds) amounted to $81,489,885, while management expenses were $9,685,223. For the prior year, grants authorized (net of grant refunds) were $71,464,219 and management expenses were $12,448,508.

Grant payments in 2015 were $79,029,542 compared to $81,296,447 for the prior year. Together with management expenses, investment expenses, and provision for taxes, the total of cash expenditures net of grant refunds in 2015 was $99,518,900 while in 2014 the amount was 107,077,903.

Grants authorized and payments made during the year ended December 31, 2015 are summarized in the following table:

Grants unpaid at December 31, 2014	$	52,622,215
Authorized during 2015		81,489,885
Payments during 2015		(79,029,542)
Grants unpaid at December 31, 2015	$	55,082,558

The fair value of the Foundation's total assets was $1,776,096,938 at December 31, 2015 including investments valued at $1,774,796,670 as compared with total assets of $1,875,962,450 at December 31, 2014.

Consolidated Financial Statements and
Supplementary Information Together with
Report of Independent Certified Public Accountants

ALFRED P. SLOAN FOUNDATION

December 31, 2015 and 2014

Audited Financial Statements and Schedules

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Audit • Tax • Advisory

Grant Thornton LLP
666 Third Avenue, 13th Floor
New York, NY 10017—4011

T 212.599.0100
F 212.370.4520
www.GrantThornton.com

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

To the Board of Trustees of
Alfred P. Sloan Foundation:

We have audited the accompanying consolidated financial statements of the Alfred P. Sloan Foundation (the "Foundation"), which comprise the consolidated statements of financial position as of December 31, 2015 and 2014, and the related consolidated statements of activities and cash flows, for the years then ended, and the related notes to the consolidated financial statements.

Management's responsibility for the financial statements
Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's responsibility
Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion
In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the consolidated financial position of the Alfred P. Sloan Foundation as of December 31, 2015 and 2014, and the changes in their net assets and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Supplementary information
Our audit was conducted for the purpose of forming an opinion on the basic 2015 consolidated financial statements as a whole. The schedule of management and investment expenses for the years ended December 31, 2015 and 2014 on page 17 and the schedule of grants and appropriations for the year ended December 31, 2015 on pages 18 through 22 are presented for purposes of additional analysis and are not a required part of the basic consolidated financial statements. Such supplementary information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic consolidated financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic consolidated financial statements and certain additional procedures. These additional procedures included comparing and reconciling the information directly to the underlying accounting and other records used to prepare the consolidated financial statements or to the consolidated financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America established by the American Institute of Certified Public Accountants. In our opinion, the supplementary information is fairly stated, in all material respects, in relation to the consolidated financial statements as a whole.

New York, New York
_____, 2016

Alfred P. Sloan Foundation

Consolidated Statements of Financial Position

As of December 31, 2015 and 2014

	2015	2014
ASSETS		
Cash	$ 1,300,268	$ 1,356,562
Receivables	—	20,329,713
Investments (Note 3):		
Direct investments—equities	175,558,458	180,434,633
Direct investments—fixed income	115,816,392	91,210,296
Direct investments—mutual and exchange traded funds	163,856,161	171,446,255
Alternative investments	1,319,565,659	1,411,184,991
Total investments	1,774,796,670	1,854,276,175
Total assets	$ 1,776,096,938	$ 1,875,962,450
LIABILITIES AND NET ASSETS		
LIABILITIES		
Grants payable (Note 8)	$ 55,082,558	$ 52,622,215
Federal excise tax payable (Note 5)	12,523,918	12,326,912
Deferred compensation arrangements	205,250	139,350
Accrued postretirement health benefit obligation (Note 7)	8,129,782	7,162,185
Other liabilities	71,150	126,881
Total liabilities	76,012,658	72,377,543
Commitments (Notes 3, 4, and 9)		
NET ASSETS—unrestricted	1,700,084,280	1,803,584,907
Total liabilities and net assets	$ 1,776,096,938	$ 1,875,962,450

The accompanying notes are an integral part of these consolidated financial statements.

Alfred P. Sloan Foundation

Consolidated Statements of Activities

For the years ended December 31, 2015 and 2014

	2015	2014
INVESTMENT INCOME		
Interest and dividends	$ 8,148,951	$ 13,531,531
Less:		
Investment expenses	(7,574,135)	(8,557,948)
Provision for taxes (Note 5)	(3,230,000)	(4,775,000)
	(10,804,135)	(13,332,948)
Net investment income	(2,655,184)	198,583
EXPENSES		
Grants (net of refunds of $351,424 in 2015 and $208,571 in 2014)	81,489,885	71,464,219
Management expenses	9,685,223	12,448,508
	91,175,108	83,912,727
Excess of expenses over net investment income	(93,830,292)	(83,714,144)
INVESTMENT GAINS		
Net realized gain on disposal of investments	114,119,654	103,400,852
Unrealized loss on investments, net of deferred federal excise tax expense of $9,248,935 and $11,769,232 in 2015 and 2014, respectively	(123,494,560)	(21,815,814)
	(9,374,906)	81,585,038
Decrease in net assets before postretirement benefit adjustments	(103,205,198)	(2,129,106)
Amounts not yet recognized as a component of net periodic benefit cost	(295,429)	(259,832)
Decrease in net assets	(103,500,627)	(2,388,938)
Net assets at beginning of year	1,803,584,907	1,805,973,845
Net assets at end of year	$ 1,700,084,280	$ 1,803,584,907

The accompanying notes are an integral part of these consolidated financial statements.

Alfred P. Sloan Foundation

Consolidated Statements of Cash Flows

For the years ended December 31, 2015 and 2014

	2015	2014
CASH FLOWS FROM OPERATING ACTIVITIES		
Decrease in net assets	$ (103,500,627)	$ (2,388,938)
net cash used in operating activities:		
Net realized gain on disposal of investments	(114,119,654)	(103,400,852)
Unrealized loss on investments	126,014,857	22,261,034
Decrease (increase) in other assets	20,329,713	(20,329,713)
Increase (decrease) in federal excise tax payable	197,006	(653,722)
Increase (decrease) in grants payable	2,460,343	(9,832,228)
Increase in accrued postretirement health benefit obligation	967,597	892,106
Increase (decrease) in deferred compensation arrangements	65,900	(789,205)
(Decrease) increase in other liabilities	(55,731)	13,646
Net cash used in operating activities	(67,640,596)	(114,227,872)
CASH FLOWS FROM INVESTING ACTIVITIES		
Proceeds from sales of investments	75,729,200	127,870,315
Purchases of investments	(8,144,898)	(13,530,400)
Net cash provided by investing activities	67,584,302	114,339,915
Net (decrease) increase in cash	(56,294)	112,043
Cash at beginning of year	1,356,562	1,244,519
Cash at end of year	$ 1,300,268	$ 1,356,562

The accompanying notes are an integral part of these consolidated financial statements.

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

1. ORGANIZATION

The Alfred P. Sloan Foundation is a philanthropic private foundation which makes grants to support original research and broad-based education related to science, technology, and economics that aim to improve the quality of American life. The Alfred P. Sloan Foundation is unique in its focus on science, technology, and economic institutions. It believes the scholars and educators who work in these fields are chief drivers of the nation's health and prosperity. The Foundation also believes that broad-based education of the public about science, technology and economics, and the scholars who do research in these areas, is an essential complement to research and practice in these areas. In each grant program, the Foundation seeks proposals for original projects led by outstanding individuals or teams that will advance these goals. The Alfred P. Sloan Foundation is interested in projects that it expects will result in significant benefits to society, and for which funding from the private sector, the government, or other foundations is not widely available. The Alfred P. Sloan Foundation's investment portfolio provides the financial resources to support its activities. The investment strategy for the investment portfolio is to invest prudently in a diversified portfolio of assets with the goal of achieving superior returns.

In June 2009, Sloan Projects LLC was established under the Delaware Limited Liability Company Act. The Alfred P. Sloan Foundation and Sloan Projects LLC share the common charitable and educational purpose of supporting, among other projects, film, theatrical, and television projects that promote education about science, technology, economics, and the scholars who do research in these areas. Sloan Projects LLC is a single member limited liability company ("LLC") with the sole member being the Alfred P. Sloan Foundation. Sloan Projects LLC is consolidated with Alfred P. Sloan Foundation for financial statement and tax purposes.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting

The accompanying consolidated financial statements have been prepared on the accrual basis of accounting and include the assets, liabilities, net assets, and financial activities of Alfred P. Sloan Foundation and Sloan Projects LLC (collectively, the "Foundation"). All significant inter-organization balances and transactions have been eliminated in consolidation.

Income Taxes

Alfred P. Sloan Foundation is exempt from federal income tax under Section 501(c)(3) of the Internal Revenue Code (the "Code") and is a private foundation as defined in Section 509(a) of the Code. Sloan Projects LLC is a single member LLC and is a disregarded entity for tax purposes. The Foundation recognizes the effect of income tax positions only if those positions are more likely than not of being sustained.

Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date. Fair value is a market-based measurement, not an entity-specific measurement, and sets out a fair value hierarchy with the highest priority being quoted prices in active markets. The Foundation discloses fair value measurements by level within that hierarchy. The fair value hierarchy maximizes the use of observable inputs and minimizes the use of

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Notes to Consolidated Financial Statements

December 31, 2015 and 2014

unobservable inputs by requiring that the most observable inputs be used when available. Observable inputs are those that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Foundation as of the reporting date. Unobservable inputs reflect the Foundation's assumptions about the inputs market participants would use in pricing the asset or liability developed based on the best information available in the circumstances. The fair value is categorized into three levels based on the inputs as follows:

Level 1— Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Foundation has the ability to access at the measurement date. An active market for the asset or liability is a market in which transactions for the asset or liability occur with sufficient frequency and volume to provide pricing information on an ongoing basis. A quoted price in an active market provides the most reliable evidence of fair value and shall be used to measure fair value whenever available. Since valuations are based on quoted prices that are readily available and regularly available in an active market, valuation of these securities does not entail a significant degree of judgment.

Level 2— Valuations based on quoted prices in markets that are not active or for which all significant inputs are observable, either directly or indirectly.

Level 3— Valuations based on inputs that are unobservable and significant to the overall fair value measurement. Unobservable inputs shall be used to measure fair value to the extent that observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date.

The categorization of a financial instrument within the fair value hierarchy is based upon the pricing transparency of the instrument and does not necessarily correspond to the Foundation's perceived risk of that instrument.

The Foundation follows the accounting standards of the Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Subtopic, 820-10-35-59, *Fair Value Measurement and Disclosures—Fair Value Measurements of Investments in Certain Entities That Calculate Net Asset Value per Share (or its Equivalent)*. This allows for the estimation of the fair value of investments in investment companies, for which the investment does not have a readily determinable fair value, using net asset value per share or its equivalent, as provided by the investment managers. The Foundation reviews and evaluates the values provided by the investment managers and agrees with the valuation methods and assumptions used in determining the net asset values of these investments as of the measurement date. These estimated fair values may differ significantly from the values that would have been used had a ready market for these securities existed.

In May 2015, the FASB issued Accounting Standards Update No. 2015-07, Fair Value Measurement (Topic 820): *Disclosures for Investments in Certain Entities that Calculate Net Asset Value per Share (or its Equivalent)* (ASU 2015-07). The amendments within ASU 2015-07 remove the requirement to categorize within the fair value hierarchy all investments for which fair value is measured using the net

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

asset value per share as a practical expedient. ASU 2015-07 is effective for non-public entities with fiscal years beginning after December 15, 2016, however early adoption is permitted. The reporting entity is required upon adoption to apply the amendments retrospectively to all periods presented.

The Foundation early adopted ASU 2015-07 effective January 1, 2015 and has applied the amendments retroactively for all periods presented, as required by the ASU. The adoption of this new guidance by the Foundation only amended disclosure requirements and did not have an impact on the Foundation's consolidated financial statements for the periods presented.

Investments
Investments in equity securities with readily determinable fair values are reported at fair value based on quoted market prices. Investments in debt securities are measured using quoted market prices where available. If quoted market prices for debt securities are not available, the fair value is determined using an income approach valuation technique that considers, among other things, rates currently observed in publicly traded markets for debt with similar terms to companies with comparable credit risk, the issuer's credit spread, and illiquidity by sector and maturity.

Gains and losses on disposal of investments are determined on the first-in, first-out basis on a trade date basis.

Concentrations of Credit Risk
Financial instruments which potentially subject the Foundation to concentrations of credit risk consist of cash and cash equivalents, equity and fixed-income securities and alternative investments. The Foundation maintains its cash in various bank deposit accounts which, at times, may exceed federally insured limits. The Foundation's cash accounts were placed with high credit quality financial institutions. The Foundation has not experienced, nor does it anticipate, any losses with respect to such accounts. The Foundation has a significant investment in equities, fixed income securities, mutual and exchange-traded funds and alternative investments, both marketable and non-marketable, and is therefore subject to concentrations of credit risk.

Grants
Grants are recorded as an expense of the Foundation when authorized by the Board of Trustees and the grantee has been selected and notified. In certain instances (e.g. Sloan research fellowships), grants are recorded as an expense and liability when the Board of Trustees appropriates amounts for selected projects. Refunded grants are recorded as a reduction to grant expense. Conditional grants are not recorded until the conditions are substantially met.

Use of Estimates
The preparation of consolidated financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates.

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

Subsequent Events

The Foundation evaluated its December 31, 2015 consolidated financial statements for subsequent events through July 5, 2016, the date the consolidated financial statements were available to be issued. The Foundation is unaware of any events that would require disclosure in the accompanying consolidated financial statements.

3. INVESTMENTS

The following tables present the fair value hierarchy of investments, the only financial instruments of the Foundation that are measured at fair value on a recurring basis, at December 31, 2015 and 2014:

	Fair value measurements at December 31, 2015				
	Total	Level 1	Level 2	Level 3	Net Asset Value
Direct investments:					
Equities:					
Domestic	$ 125,355,398	$ 125,355,398	$ —	$ —	$ —
International	50,203,060	50,203,060	—	—	—
	175,558,458	175,558,458	—	—	—
Fixed income:					
U.S. government	115,816,392	115,816,392	—	—	—
Mutual & exchange-traded funds:					
Equities	80,602,245	80,602,245	—	—	—
Independent return	51,014,529	51,014,529	—	—	—
Fixed income	32,239,387	32,239,387	—	—	—
	163,856,161	163,856,161	—	—	—
Alternative investments:					
Equities:					
Domestic	157,945,001	—	—	—	157,945,001
Long/short	185,811,038	—	—	—	185,811,038
International	275,403,996	—	—	—	275,403,996
Fixed income:					
Global sovereign bonds	54,626,654	—	—	—	54,626,654
High yield	2,341,822	—	—	—	2,341,822
Independent return	450,573,562	—	—	2,254,781	448,318,781
Real estate	13,247,881	—	—	—	13,247,881
Private equity	179,615,705	—	—	—	179,615,705
	1,319,565,659	—	—	2,254,781	1,317,310,878
	$ 1,774,796,670	$ 455,231,011	$ —	$ 2,254,781	$ 1,317,310,878

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

	Fair value measurements at December 31, 2014				
	Total	**Level 1**	**Level 2**	**Level 3**	**Net Asset Value**
Direct investments:					
Equities:					
Domestic	$ 126,382,586	$ 126,382,586	$ —	$ —	$ —
International	54,052,047	54,052,047	—	—	—
	180,434,633	180,434,633	—	—	—
Fixed income:					
U.S. government	91,210,296	91,210,296	—	—	—
Mutual & exchange-traded funds:					
Equities	80,302,836	80,302,836	—	—	—
Independent return	49,858,296	49,858,296	—	—	—
Fixed income	41,285,123	41,285,123	—	—	—
	171,446,255	171,446,255	—	—	—
Alternative investments:					
Equities:					
Domestic	159,479,551	—	—	—	159,479,551
Long/short	164,175,833	20,403,003	—	—	143,772,830
International	263,389,331	—	—	—	263,389,331
Fixed income:					
Global sovereign bonds	58,125,827	—	—	—	58,125,827
High yield	50,483,311	—	—	—	50,483,311
Independent return	486,384,616	3,985,578	—	4,780,500	477,618,538
Real estate	17,659,701	—	—	2,870,162	14,789,539
Private equity	211,486,821	—	—	—	211,486,821
	1,411,184,991	24,388,581	—	7,650,662	1,379,145,748
	$ 1,854,276,175	$ 467,479,765	$ —	$ 7,650,662	$ 1,379,145,748

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

The following table presents a reconciliation for all Level 3 assets measured at fair value at December 31, 2015:

	Beginning Balance	Purchases	Settlements/ Redemptions	Total Net Realized and Unrealized Gains	Transfers In/ (Out) *	Ending Balance
Alternative Investments:						
Independent return	$ 4,780,500	$ —	$ (3,167,899)	$ 642,180	$ —	$ 2,254,781
Real estate	2,870,162	—	(2,870,772)	610	—	—
	$ 7,650,662	$ —	$ (6,038,671)	$ 642,790	$ —	$ 2,254,781

The following table presents the reconciliation for all Level 3 assets measured at fair value at December 31, 2014:

	Beginning Balance	Purchases	Settlements/ Redemptions	Total Net Realized and Unrealized Gains	Transfers In/ (Out) **	Ending Balance
Alternative Investments:						
Independent return	$ 5,690,722	$ —	$ —	$ (910,222)	$ —	$ 4,780,500
Real estate	6,865,171	—	(5,210,580)	1,215,571	—	2,870,162
	$ 12,555,893	$ —	$ (5,210,580)	$ 305,349	$ —	$ 7,650,662

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

The following table lists the redemption terms and unfunded commitments for the alternative investments as of December 31, 2015 and 2014:

	2015					
	# of Funds	Fair Value	Unfunded Commitments (in millions)	Redemption Frequency	Redemption Notice Period	Lock-up Period
Alternative investments:						
Equities:						
Domestic	2	$ 157,945,001	$ —	monthly, quarterly	30-60 days	None
Long/short	6	185,811,038	—	monthly, quarterly, other	30-90 days	None
International	4	275,403,996	—	monthly, quarterly, other	10-60 days	None
Fixed income:						
Global sovereign bonds	1	54,626,654	—	monthly	10 days	None
High Yield	1	2,341,822	—	None	90 days	None
Independent return	20	450,573,562	31	daily, monthly, quarterly, annually, other	30-180 days	none, 1-year, rolling 2-year
Real estate	4	13,247,881	2	None	N/A	N/A
Private equity	42	179,615,705	78	None	N/A	N/A
Total		$ 1,319,565,659	$ 111			

	2014					
	# of Funds	Fair Value	Unfunded Commitments (in millions)	Redemption Frequency	Redemption Notice Period	Lock-up Period
Alternative investments:						
Equities:						
Domestic	2	$ 159,479,551	$ —	monthly, quarterly	30-60 days	None
Long/short	7	164,175,833	—	monthly, quarterly, other	30-90 days	none, 1-year
International	4	263,389,331	—	monthly, quarterly, other	10-60 days	none, 1-year
Fixed income:						
Global sovereign bonds	1	58,125,827	—	monthly	10 days	None
High Yield	1	50,483,311	—	semi-annually	90 days	None
Independent return	21	486,384,616	17	daily, monthly, quarterly, annually, other	30-180 days	none, 1-year, rolling 2-year
Real estate	5	17,659,701	3	None	N/A	N/A
Private equity	43	211,486,821	51	None	N/A	N/A
Total		$ 1,411,184,991	$ 71			

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

Equities: Alternative investments in this category invest predominantly in equity securities including U.S., international developed and emerging markets, benchmarked against MSCI All Country World Index. Equity funds range from no lock-up provisions to no more than 1 year.

Fixed Income: Alternative investments in this category invest in domestic and international fixed income securities, benchmarked against Composite of Barclays Capital U.S. Intermediate Government Credit Index and Citigroup Broad index.

Independent Return: Independent return funds include investments such as low net exposure equity hedge funds, distressed credit, and merger arbitrage. Such strategies are expected to have equity-like long-term returns but with less correlation to the equity markets. $73 million is invested in drawdown structures with no predetermined redemption date.

Real Estate: Includes funds that invest primarily in commercial real estate, all of which are illiquid investments.

Private Equity: Includes private equity and venture capital, all of which are illiquid investments.

Private foundations are required by the Internal Revenue Service to distribute 5% of average assets during the year. In order to plan and budget in an orderly manner, the Foundation implements the 5% rule by using a 12-quarter rolling average of the fair value of its investment portfolio to determine the distribution level for the year. The last quarter on the 12-quarter rolling average is September 30th.

4. FINANCIAL INSTRUMENTS WITH OFF-BALANCE-SHEET CREDIT OR MARKET RISK

The Foundation's investment strategy has the ability to incorporate certain financial instruments that involve, to varying degrees, elements of market risk and credit risk in excess of the amounts recorded on the consolidated financial statements.

During 2015, the Foundation sold options contracts. S&P 500 Index put options sold were valued at approximately $4.2 million at December 31, 2015 and $4 million at December 31, 2014. The Foundation does not anticipate that losses, if any, resulting from its market or credit risks would materially affect its consolidated financial statements.

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

5. TAXES

The Foundation is liable for a federal excise tax of 2% of its net investment income, which includes realized capital gains. However, this tax is reduced to 1% if certain conditions are met. The Foundation did not meet the requirements for the 1% tax for the years ended December 31, 2015 and 2014. Therefore, current taxes are estimated at 2% of net investment income for 2015 and 2014. Additionally, certain of the Foundation's investments give rise to unrelated business income tax liabilities. Such tax liabilities for 2015 and 2014 are not material to the accompanying consolidated financial statements; however, the provision for taxes, as of December 31, 2015 and 2014, includes an estimate of tax liabilities for unrelated business income.

Deferred taxes principally arise from differences between the cost value and fair value of investments. Since the qualification for the 1% tax is not determinable until the fiscal year in which net gains are realized, deferred taxes represent 2% of unrealized gains at December 31, 2015 and 2014.

6. RETIREMENT PLAN

The Foundation has a defined contribution retirement plan covering substantially all employees under arrangements with Teachers Insurance and Annuity Association of America and College Retirement Equities Fund and Fidelity Investments. Retirement plan expense was $803,920 and $824,656 in 2015 and 2014, respectively.

7. POSTRETIREMENT BENEFITS OTHER THAN PENSIONS

The Foundation provides healthcare benefits for qualified retirees. The Foundation records annual amounts relating to the plan based on calculations that incorporate various actuarial and other assumptions, including discount rates, mortality, turnover rates, and healthcare cost trend rates.

The Foundation reviews its assumptions on an annual basis and makes modifications to the assumptions based on current rates and trends as appropriate. The effect of modifications to those assumptions is recorded as a charge to net assets and amortized to net periodic cost over future periods using the corridor method. The net periodic costs are recognized as employees render the services necessary to earn the postretirement benefits.

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

The following table sets forth the financial information for the plan for 2015 and 2014:

	2015	2014
Change in accrued postretirement benefit obligation:		
Benefit obligation at beginning of year	$ 7,162,185	$ 6,270,079
Service cost	224,623	160,020
Interest cost	272,010	297,709
Actuarial loss	771,490	735,893
Benefits paid	(300,526)	(301,516)
Benefit obligation at end of year	$ 8,129,782	$ 7,162,185
Components of net periodic postretirement benefit cost reported:		
Service cost	$ 224,623	$ 160,020
Interest cost	272,010	297,709
Amortization of transition obligation	476,061	476,061
Amortization of gain	(101,879)	(170,878)
Net periodic postretirement benefit cost	$ 870,815	$ 762,912
Benefit obligation weighted average assumptions at December 31, 2015 and 2014:		
Discount rate	4.29%	3.88%
Periodic benefit cost weighted average assumptions for the years ended December 31, 2015 and 2014:		
Discount rate	3.88%	4.86%

The medical trend and inflation rate is 8% in 2016 grading down to 5.75% in 2019 and 5% ultimately.

Assumed healthcare cost trend rates have a significant effect on the amounts reported for the postretirement health benefit plan. The effects of a 1% increase (decrease) in trend rates on total service and interest cost and the postretirement health benefit obligation are as follows:

	2015		2014	
	1% Increase	1% Decrease	1% Increase	1% Decrease
Effect on total service and interest cost	$ 103,881	$ (100,648)	$ 75,976	$ (67,104)
Effect on postretirement benefit obligation	1,394,627	(1,094,176)	1,140,635	(907,623)

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

Projected premium payments for each of the next five fiscal years and thereafter are as follows:

Year ending December 31:		
2016	$	340,280
2017		345,373
2018		344,531
2019		360,580
2020		361,706
Thereafter through 2024		1,898,194
	$	3,650,664

The accumulated amount not yet recognized as a component of net periodic benefit cost was $91,320 and $(305,988) at December 31, 2015 and 2014, respectively. The components are as follows:

	2015		**2014**	
Transition obligation	$	1,987,162	$	2,463,223
Net actuarial gain		(1,895,842)		(2,769,211)
	$	91,320	$	(305,988)

The transition obligation and actuarial gain that will be amortized into net periodic benefit cost in 2015 will be $476,061 and $101,879, respectively.

8. GRANTS PAYABLE

The Foundation estimates that the grants payable balance as of December 31, 2015 will be paid as follows:

Year:		
2016	$	35,852,991
2017		16,739,514
2018		2,190,053
2019		300,000
	$	55,082,558

The Foundation awards multi-year grants for certain programs with continued annual funding contingent upon the respective grantee satisfying certain performance criteria as outlined in the executed grant agreement; accordingly, the Foundation has not recorded a liability for these conditional awards which are subject to annual review. There were no conditional grant commitments at December 31, 2015.

Alfred P. Sloan Foundation

Notes to Consolidated Financial Statements

December 31, 2015 and 2014

9. LEASE

Rent expense for 2015 and 2014, including escalations, was $1,346,014 and $1,433,273, respectively. On November 21, 2013, the Foundation modified the original lease to provide for the leasing of a portion of the 22nd floor as substitute premises and to surrender the original premises on the 25th floor. The substitute premises were delivered on February 27, 2014. The Foundation vacated the original premises and provided written notice that the surrender date of the original premises was September 16, 2014, on which date the term of the original lease expired and the original lease was deemed modified. As a result of the lease modification, rent commencement on the substitute premises began on February 27, 2015 for a period of fifteen years ending on February 28, 2030. The fixed rent payable under the lease is an amount equal to (a) $1,740,492 per annum for the period commencing on February 27, 2015 and ending on February 26, 2020 and (b) $1,874,376 per annum for the period commencing on February 27, 2020 and ending on February 26, 2025 and (c) $2,008,260 per annum for the period commencing on February 27, 2025 and ending on February 28, 2030.

10. LINE OF CREDIT

The Foundation established a $40,000,000 line of credit with Bank of New York Mellon to provide bridge funding of grants and to finance short-term working capital needs of the Foundation. To date, the Foundation has not yet used the line of credit. The interest rate is calculated using the Mellon Monthly LIBOR plus 75 basis points, with a fallback rate of Wall Street Journal Prime minus 125 basis points. The interest rate was 2% at December 31, 2015 and 2014. If the line is used, interest will be payable monthly on the 15th of each month and principal will be due on demand. If payment is not made within 15 days following the payment date, a $25 late fee will be assessed.

SUPPLEMENTARY INFORMATION

Alfred P. Sloan Foundation

Schedule of Management and Investment Expenses

For the years ended December 31, 2015 and 2014

	2015	2014
Management expenses:		
Salaries and employees' benefits:		
Salaries	$ 7,124,026	$ 6,242,611
Employees' retirement plan and other benefits	2,707,796	2,780,403
Total	9,831,822	9,023,014
Rent	1,346,014	1,433,273
Program expenses	1,030,824	917,644
Office expenses	790,373	4,168,162
Website and publications	92,812	86,754
Professional fees	1,393,599	989,338
Total management expenses	14,485,444	16,618,185
Less direct investment and other management expenses allocated to investments	(4,800,221)	(4,169,677)
Management expenses	$ 9,685,223	$ 12,448,508
Investment expenses:		
Investment management fees	$ 2,773,914	$ 4,388,271
Direct investment and other management expenses allocated to investments	4,800,221	4,169,677
Investment expenses	$ 7,574,135	$ 8,557,948

This schedule should be read in conjunction with the accompanying consolidated financial statements and notes thereto.

Alfred P. Sloan Foundation

Schedule of Grants and Appropriations

For the year ended December 31, 2014

Grantee	Unpaid December 31, 2014	2015 Authorized	2015 Payments	Unpaid December 31, 2015
Aberdeen Foundation, Inc., University of	$ —	$ 335,000	$ 335,000	$ —
Adler Planetarium	307,648	—	307,648	—
American Academy of Arts and Sciences	100,000	—	50,000	50,000
American Association for the Advancement of Science	138,426	941,907	500,521	579,812
American Associates of the National Theatre	—	83,938	83,938	—
American Astronomical Society	—	19,775	19,775	—
American Council on Education	—	122,739	122,739	—
American Film Institute	—	315,000	125,000	190,000
Arius Association	30,000	—	30,000	—
Association of Research Libraries	—	600,000	600,000	—
Astrophysical Research Consortium	7,125,000	700,000	5,275,000	2,550,000
Aspen Institute	—	20,000	20,000	—
Australian National University	194,548	—	194,548	—
Baron, David	15,000	—	15,000	—
Baylor College of Medicine	—	50,000	50,000	—
Baylor University	93,250	—	—	93,250
Behavioral Science & Policy Association	—	19,700	—	19,700
Benefits Data Trust	—	330,526	253,053	77,473
Boston College	186,298	482,630	436,298	232,630
Boston Symphony Orchestra	—	20,000	20,000	—
Boston University	—	704,982	300,000	404,982
Brandeis University	—	50,000	50,000	—
Brave New Software	—	20,000	—	20,000
British Columbia, University of	166,187	50,000	216,187	—
Brown University	—	144,205	144,205	—
Business-Higher Education Forum	—	650,000	400,000	250,000
California, University of, Berkeley	1,095,238	3,826,663	3,077,385	1,844,516
California, University of, Davis	508,796	1,947,485	1,358,796	1,097,485
California, University of, Irvine	393,006	120,000	300,000	213,006
California, University of, Los Angeles	—	4,645,311	2,340,000	2,305,311
California, University of, San Diego	—	1,376,812	1,376,812	—
California, University of, Santa Barbara	—	50,000	50,000	—
Carnegie Endowment for International Peace	24,997	75,000	99,997	—

This schedule should be read in conjunction with the accompanying consolidated financial statements and notes thereto.

Alfred P. Sloan Foundation

Schedule of Grants and Appropriations

For the year ended December 31, 2014

Grantee	Unpaid December 31, 2014	2015		Unpaid December 31, 2015
		Authorized	Payments	
California Institute of Technology	$ —	$ 581,742	$ 447,807	$ 133,935
Carnegie Institution of Washington	1,583,000	1,250,000	2,208,000	625,000
Carnegie Mellon University	—	1,824,083	866,000	958,083
Catticus Corporation	500,000	—	—	500,000
Cell Motion Laboratories, Inc.	—	800,000	50,000	750,000
Chicago, University of	—	4,095,692	2,247,146	1,848,546
Cincinnati, University of	—	110,000	110,000	—
Cold Spring Harbor Laboratory	—	50,000	50,000	—
Colorado School of Mines	—	12,000	12,000	—
Colorado State University	—	113,773	113,773	—
Colorado, University of, at Boulder	1,033,261	(219,532)	555,428	258,301
Columbia University	285,000	2,144,962	1,545,326	884,636
Computing Research Association	20,000	—	20,000	—
Coolidge Corner Theatre Foundation	—	748,392	350,000	398,392
Cornell University	100,000	735,970	535,970	300,000
Council for Economic Education	—	163,980	100,000	63,980
Council on Foreign Relations	714,059	—	400,000	314,059
Council on Foundations, Inc.	—	45,000	45,000	—
Council of Graduate Schools	—	141,472	141,472	—
Council on Library and Information Resources	239,092	738,756	804,095	173,753
Creative Visions	—	866,281	666,281	200,000
CUNY TV Foundation	382,200	481,100	663,300	200,000
Dartmouth College	307,163	—	307,163	—
Data & Society Research Institute	—	49,975	49,975	—
Delaware, University of	—	50,000	50,000	—
Digital Public Library of America, Inc.	—	2,026,628	1,124,919	901,709
Drexel University	237,897	—	116,472	121,425
Duke University	99,951	458,903	349,951	208,903
Emory University	—	10,165	10,165	—
Ensemble Studio Theatre, Inc.	597,000	—	597,000	—
Environmental Defense Fund Incorporated	127,125	600,000	727,125	—
Fedcap Rehabilitation Services, Inc.	—	124,828	124,828	—
Film Independent, Inc.	535,628	—	410,628	125,000

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Alfred P. Sloan Foundation

Schedule of Grants and Appropriations

For the year ended December 31, 2014

Grantee	Unpaid December 31, 2014	2015 Authorized	2015 Payments	Unpaid December 31, 2015
Forsyth Institute	$ 120,000	$ —	$ 60,000	$ 60,000
Foundation Center	—	75,000	75,000	—
FPF Education and Innovation Foundation	—	75,000	75,000	—
Friends of NTU	—	125,000	125,000	—
Fund for the City of New York	855,000	780,000	280,000	1,355,000
Fund for Public Health in New York, Inc.	—	1,044,516	500,000	544,516
Georgia Institute of Technology	—	50,000	50,000	—
Georgia State University	—	50,000	50,000	—
George Mason University	—	736,042	431,202	304,840
George Washington University	—	10,000	10,000	—
Graduate Center of The City University of New York	—	15,000	—	15,000
Greater Washington Educational Telecommunications Association Inc.	700,000	—	600,000	100,000
GuideStar USA., Inc.	—	10,000	10,000	—
Harvard University	870,018	4,113,090	2,081,647	2,901,461
Hypothesis Project	20,000	—	20,000	—
Illinois Institute of Technology	60,000	—	60,000	—
Illinois, University of, Chicago	—	50,000	50,000	—
Illinois, University of, Urbana-Champaign	—	150,000	150,000	—
Indiana, University of	300,000	50,000	350,000	—
Institut de Physique du Globe de Paris	—	300,150	100,150	200,000
Institute for Advanced Study	—	121,543	121,543	—
Institute for the Future	—	35,000	—	35,000
Institute of International Education Inc.	500,000	—	250,000	250,000
Institute on Science for Global Policy	—	125,000	125,000	—
International Energy Policy and Programme Evaluation Conf.	—	40,000	20,000	20,000
Iowa, University of	—	105,000	105,000	—
Johns Hopkins University	250,000	99,955	349,955	—
L.A. Theatre Works	250,000	—	125,000	125,000
Loyola University Chicago	—	207,000	112,125	94,875
Manhattan Theatre Club	—	725,000	325,000	400,000
Marine Biological Laboratory	400,000	1,250,000	1,050,000	600,000

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Alfred P. Sloan Foundation

Schedule of Grants and Appropriations

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Grantee	Unpaid December 31, 2014	2015 Authorized	2015 Payments	Unpaid December 31, 2015
Maryland Center for Environmental Science, University of	$ —	$ 50,000	$ 50,000	$ —
Maryland, University of, College Park	62,845	87,155	150,000	—
Massachusetts Institute of Technology	1,536,798	614,718	1,612,562	538,954
Miami Foundation, Inc.	—	640,000	480,000	160,000
Michigan, University of	1,169,918	869,347	1,606,026	433,239
Michigan, University of, Ann Arbor	60,000	—	60,000	—
Minnesota, University of	—	50,000	50,000	—
Missouri, University of	—	50,000	50,000	—
Mozilla Foundation	409,740	—	409,740	—
Museum of the Moving Image	75,000	—	75,000	—
Mycological Society of America	—	28,500	—	28,500
National Academy of Sciences	845,000	(80,000)	495,000	270,000
National Academy of Social Insurance	64,969	—	64,969	—
National Action Council for Minorities in Engineering, Inc.	3,718,075	2,000,000	2,785,000	2,933,075
National Bureau of Economic Research, Inc.	1,150,641	3,233,022	2,395,009	1,988,654
National Geographic Society	—	48,539	48,539	—
National Information Standards Organization	—	48,943	—	48,943
National Opinion Research Center	559,715	—	559,715	—
National Public Radio, Inc.	—	550,000	300,000	250,000
Natural Heritage Trust	—	25,000	25,000	—
New America	—	20,000	20,000	—
New School for Social Research	—	960,000	560,000	400,000
New Venture Fund	—	180,000	180,000	—
New York Academy of Sciences	—	12,000	12,000	—
New York Botanical Garden	555,244	—	300,000	255,244
New York Genome Center, Inc.	—	3,000,000	3,000,000	—
New York Public Radio	1,000,000	—	600,000	400,000
New York University	1,543,002	1,409,289	1,305,270	1,647,021
North Carolina State University	147,161	50,000	197,161	—
North Carolina, University of, at Chapel Hill	—	200,000	200,000	—
Northern Arizona University	—	239,775	139,775	100,000
Northeastern University	—	50,000	50,000	—

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Alfred P. Sloan Foundation

Schedule of Grants and Appropriations

For the year ended December 31, 2014

Grantee	Unpaid December 31, 2014	2015		Unpaid December 31, 2015
		Authorized	Payments	
Northwestern University	$ 15,000	$ 358,536	$ 215,000	$ 158,536
NumFOCUS	10,000	20,000	30,000	—
Ohio State University	—	50,000	50,000	—
Open Knowledge Foundation	—	690,575	440,575	250,000
Oregon Health & Science University	—	50,000	50,000	—
Oregon State University	—	119,444	119,444	—
Oregon, University of	—	1,525,000	825,000	700,000
Ottawa, University of	300,000	50,000	350,000	—
PBS Foundation	300,000	—	300,000	—
Pennsylvania, University of	100,000	976,472	600,000	476,472
Philanthropy New York	—	28,000	28,000	—
Phoenix Bioinformatics	—	498,945	498,945	—
Pittsburgh, University of	—	123,728	—	123,728
Princeton University	461,735	224,755	462,835	223,655
PRX Incorporated	150,000	500,000	400,000	250,000
Purdue University	218,961	—	110,000	108,961
RAND Corporation	398,975	369,404	620,507	147,872
Rice University	—	50,000	50,000	—
Richard Rhodes	60,000	—	60,000	—
Rensselaer Polytechnic Institute	300,000	100,395	400,395	—
Research Foundation of the City University of New York	751,925	—	375,000	376,925
Resources for the Future, Inc.	268,590	1,073,705	946,949	395,346
Rhode Island, University of	350,000	—	350,000	—
Rochester, University of	—	50,000	50,000	—
Rockefeller Philanthropy Advisors	—	30,000	30,000	—
Rockefeller University	—	1,500,000	350,000	1,150,000
Rutgers, The State University of New Jersey	—	99,724	99,724	—
San Francisco Film Society	—	417,500	217,500	200,000
Santa Fe Institute	—	15,000	15,000	—
Science Festival Foundation	—	1,350,000	750,000	600,000
Science Friday Initiative, Inc.	225,000	—	225,000	—
Shetterly, Margot Lee	15,000	—	15,000	—
Simon Fraser University	—	50,000	50,000	—

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Alfred P. Sloan Foundation

Schedule of Grants and Appropriations

For the year ended December 31, 2014

Grantee	Unpaid December 31, 2014	2015 Authorized	2015 Payments	Unpaid December 31, 2015
Smithsonian Institution	$ 199,862	$ —	$ 199,862	$ —
Society for Human Resources Management Foundation	109,650	—	109,650	—
SoundVision Productions	289,044	—	289,044	—
South Florida, University of	—	75,000	75,000	—
Southern California, University of	119,450	572,896	468,734	223,612
Southern Regional Education Board	—	999,645	300,000	699,645
Stanford University	712,416	1,701,593	1,405,152	1,008,857
Stony Brook University	—	50,000	50,000	—
Sundance Institute	—	500,000	300,000	200,000
Syracuse University	60,000	53,900	113,900	—
System, University, of Maryland Foundation, Inc.	—	124,775	—	124,775
Technology Affinity Group	—	5,000	5,000	—
Tennessee, University of	—	76,364	76,364	—
Texas A&M University	—	20,000	20,000	—
Texas, University of, Austin	105,506	630,060	455,506	280,060
Texas, University of, Dallas	—	50,000	50,000	—
The Brookings Institution	300,000	—	100,000	200,000
The Conversation	150,000	—	—	150,000
The Goodly Institute	—	9,000	9,000	—
The Graduate Center Foundation, Inc.	—	27,000	27,000	—
Toronto, University of	100,000	416,035	516,035	—
Tribeca Film Institute	—	1,008,011	608,011	400,000
Tulsa, University of	140,000	—	140,000	—
Urban Institute	—	474,087	300,000	174,087
Utah, University of	—	50,000	50,000	—
University College London	—	50,000	—	50,000
Virginia Polytechnic Institute and State University	100,000	—	100,000	—
Virginia, University of	—	50,000	50,000	—
Washington, University of	250,000	306,475	306,475	250,000
Washington University in St. Louis	—	50,000	50,000	—
Waterloo, University of	—	50,000	50,000	—
WGBH Educational Foundation	1,025,000	2,500,000	1,875,000	1,650,000
Weill Cornell Medical College	—	119,830	119,830	—

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Schedule of Grants and Appropriations

For the year ended December 31, 2014

Grantee	Unpaid December 31, 2014	2015 Authorized	2015 Payments	Unpaid December 31, 2015
Wikimedia Foundation	$ 1,750,000	$ —	$ 750,000	$ 1,000,000
Wisconsin, University of, Madison	341,595	50,000	234,909	156,686
WNET.ORG	400,000	100,000	400,000	100,000
Wolfram Foundation	—	70,600	70,600	—
Woodrow Wilson International Center for Scholars	175,000	—	175,000	—
Yale University	842,224	356,641	841,641	357,224
TOTAL	$ 45,457,829	$ 81,252,522	$ 79,170,701	$ 47,539,650
Sloan research fellowships to be granted in ensuing year	$ 6,300,000	$ 630,000	$ —	$ 6,930,000
Other appropriations authorized but not committed	864,386	626,618	878,096	612,908
	52,622,215	82,509,140	80,048,796	55,082,558
	—	(351,424)	(351,424)	—
Refunded grants	—	(667,831)	(667,831)	—
Reduction for grant transfers				
	$ 52,622,215	$ 81,489,885	$ 79,029,542	$ 55,082,558

This schedule should be read in conjunction with the accompanying consolidated financial statements and notes thereto.

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Alfred P. Sloan Foundation
630 Fifth Avenue, Suite 2200
New York, NY 10111-0242
Tel: 212.649.1649 | Fax: 212.757.5117
www.sloan.org